MANUAL TRAINING MAGAZINE

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MANUAL TRAINING MAGAZINE

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THE EDUCATIONAL VALUE OF MANUAL TRAINING.[1]

DAVID FELMLEY.

IN THIS brief paper no attempt is made to advance any new reasons for manual training. People already acquainted with the literature of the subject will find here only a restatement of familiar argument.

Any adequate presentation of the educational value of manual training must trench upon the ground assigned to the last speaker. In fact most insistent advocates of the supreme importance of manual training in the education of every child, such as G. Stanley Hall and Miss Katherine Dopp, derive their conclusions from their evolutionary philosophy rather than from practical experience as teachers. Man is preeminently the tool-using animal. When he assumed the erect posture and freed his fore limbs to hurl the stone or grasp the club or fire-brand he made short work of the great carnivora that were the chief menace to his existence. In all the subsequent stages of culture—in warring barbarism, in agriculture, and in modern industry, from bows and arrows to Dreadnoughts and Krag-Jorgensen rifles, from the reap-hook to the modern harvester, from Tubal-Cain to Bessemer—the chief advance in ministering to his physical needs has been in the perfection of the tool.

The evolution of the tool has been paralleled by the development of the brain. The nerve-mechanisms that control the muscles of precision and nice adjustment make up the greater part of the cerebral hemispheres. Hence the frequent assertion that thru the use of the tool man's intellect has been developed. Modern man may pursue knowledge for its own sake, but with early man knowledge was of value only as it contributed to survival, that is, only as it aided in the right regulation of conduct, or to more efficient action in the struggle for existence.

[1] Address delivered before the Illinois State Teachers' Association, Springfield, December, 1909.

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If, as is generally held, the individual in his growth recapitulates the evolution of the race, it follows that the use of the tool in education is vital to the unfolding of the intellect. As Emerson puts it, "Whatever man does, or whatever befalls him opens another chamber in his soul—that is, he has got a new feeling, a new thought, a new organ."

Hence the high value of farm life for boys—now so universally recognized—with its varied activities and employments, the care of poultry, horses and other live stock, the work of the field, garden and orchard.

On the farm he has access to tools. As a boy he made rabbit-traps, sleds, wagons, hen-coops, pigeon-houses, a kennel for his dog. Later as a young man he built fences and corncribs, shaved out ax-handles, braided cattle-whips, fashioned or repaired the various tools used in farm operations. The school did something for these boys, on the social side as much as the intellectual, but the education outside of the school did more. In truth a boy's instincts are insistent and even under modern urban conditions where he cannot follow his father, his natural teacher, to the office, the factory, or the shop, as on the farm he could follow him to the field, he is going to get something of this first-hand education whether the school plans it or not. "Boys," says Emerson, "are the masters of the playground and the streets; they come like the flies." They are on hand where everything is going on. They hang around the paving gang, at the public sale; they are down at the station to welcome the circus train that steals into town in the gray dawn, and are eager watchers at every process, and helpers if permitted, until the last car is loaded at midnight.

> "The children, coming home from school,
> Look in at the open door."

They don't stop with looking in. They swarm into our shops and factories if we tolerate their presence. They board the engine and beg the engineer for a chance to work the levers. It is the boy guided by this irrepressible instinct against whom all the "keep-out" signs are directed. Manual training in the shop satisfies this deep longing to be doing something with the hands. It makes some amends for the great wrong done boyhood in transporting it to the city. In the shop he can plan and execute the projects that arouse his interest and enlist his powers. Man has grown from savagery to civilization thru his efforts to use the forces and materials of nature to satisfy his physical needs, and the true basal education is not thru the three R's, but in this planning and executing, in the manipulation of material to meet fundamental wants.

But you may say this is all theory—or a mere deduction from your theories of racial evolution and the parallel unfolding of individual powers. Shall we then undertake to schedule educational values in the old fashioned way?

In estimating educational values we usually find them in knowledge, in skill, in habits, or ideals. We find these values in the fields of physical, or mental, or of moral education. The purpose of physical education is two-fold, to afford such exercise as will lead to the proper development and functioning of the various organs, and to make the body the ready servant of the will, able to perform with ease and delight every useful act of which it is capable. In brief, its ends are health and skill. Nature thru deep-seated instincts provides for this physical development. But ordinary school life is at war with every instinct of the child's physical nature.

Nature says to the child, "Run about," the school mistress says, "Sit still!" Nature says "Seek the open air and sunshine." The teacher says "Come indoors, while I pull down the shades; so much sunlight makes me nervous." Nature says, "Use the large muscles of your body in running, jumping, climbing, throwing." The school says, "Use your fingers in the accurate adjustments needed in writing, drawing and sewing." Nature says, "Use your eyes on distant objects." The school says, "Focus them on this page ten inches away." We are all making business for the increasing army of eye-specialists and nervous disease specialists. Parents realize the truth of Spencer's saying that the first requisite to success in life is to be a good animal.

Manual training at the bench does not cure all these evils, but it puts the boy in a roomy shop where he is on his feet and may move about with some freedom. In handling the plane, saw, and draw-shave, the muscles of the trunk and legs have no mean share, while in using the hammer, chisel, square, and lathe is cultivated the delicacy and precision of the skillful workman. The discipline as a whole means muscular control, dexterity, and a fair degree of technical skill.

On the intellectual side our school manual training develops distinctly the power to grasp an idea and embody it, equips the boy with a wide knowledge of methods, devices, recipes, and machines for accomplishing the ends of his art. He is not permitted merely to copy models. He must invent new designs; he is required to reduce his somewhat vague conceptions to an accurate working drawing before he touches a tool to the valuable wood in which he works. He is rarely allowed to make the same thing twice. He would undoubtedly gain skill and speed thru

repetition, but we want to educate the brain rather than the spinal cord. If he is constantly working on new projects he must give his mind to every step of the work. Dexterity comes in the use of the individual tools, rather than in the creation of particular forms.

THE CONTRIBUTION OF SCIENCE.

On the side of knowledge our present manual training is seriously limited. Students acquire a definite knowledge of space forms and relations that forms a solid basis for all geometrical thinking and an excellent preparation for any one of the building trades. They learn a good deal of the structure and physical properties of the woods they deal with, the warping and shrinking that spoils their finest work unless due measures are taken to prevent such a catastrophe. We must give a much wider range to our manual training if it is to lead to science which is becoming more and more the real basis of every industry. Just now we are making furniture; soon we shall make more scientific apparatus, we shall introduce glass making and photography and explore the whole industrial life of the day for tools and processes that will lend themselves to the school. Reciprocally the study of science gains in interest, reality, and power if we approach it thru the arts to which the sciences minister. Here again we follow the order of nature for the beginnings of every art preceded the development of the science which explains the rationale of its processes and perfects its methods. There was metallurgy before chemistry, medicine before physiology, pumps before atmospheric physics; bread making and brewing before yeast was known to be a plant.

The best values in manual training are in the habits, ideals, and attitudes it fosters. It interests many pupils who are not successful in other school studies, holds them in school, imparts new zest for some of their other studies, gives a sense of capacity, power and effectiveness to many a boy who is almost ready to accept the teacher's estimate of his incapacity and worthlessness. It is the boys of weak will who are most benefited. They lack the ability to conceive a project, to devise ways and means for its realization, and finally the patience and persistence that continues to its accomplishment. Their want of persistence is largely an intellectual lack; their desires degenerate into mere wishes because they cannot plan the complex courses of action needed to gratify them. To strengthen the will then it is necessary to develop the willingness, the power, and the determination to think connectedly. The ordinary school studies afford many opportunities for complex thinking but many children have

little interest in abstractions. They must think in the concrete. Manual training is interesting. It connects our thinking closely with our doing.

THE APPEAL TO INTEREST.

Let the work to be undertaken be the making of a chair. The boy's interest in adding a chair to the furnishings of home or school arouses his attention; the concreteness of the task holds his attention, for every step accomplished does not lie merely in memory. It is before him as a visible, tangible reality. The variety of occupations involved constantly stimulates his interest. First is the deciding upon the particular style of chair to be made, next the construction of the working drawing showing all the details; and so on, thru all the steps, until every piece has been cut out, planed and sand-papered; the tenons and mortises accurately cut and fitted; the various parts accurately glued together; the finished chair stained, shellacked, varnished and rubbed down with pumice stone and oil. Here is a series of operations all leading to a final end, and each one is an end in itself which, when accomplished, strengthens his confidence and renews his courage to attack the next process. When finally the chair is done and stands before his eyes, a thing of utility and beauty, the joy of achievement comes to crown his labor. The consciousness of power and love of excellence grows with every such task accomplished.

Much has been said of the priceless habits gained in the shop. It is frequently asserted that such habits extend their sway over all the actions of the individual. If he learns to make square boxes he will be square in his dealings. If he is accurate in his measurements he will be accurate in his statements. If his chairs and tables stand level he will be level-headed in his judgments of men and things. To the writer it seems pretty clear that there are no generalized habits. In the well-ordered shop there is a place for every tool, and the workman is required to keep every tool in its place. He may not leave the shop until everything is in order. He soon becomes habituated to this requirement; at the mere sight of a tool out of its accustomed place, he automatically puts it where it belongs. A habit exists when the same stimulus excites the same reflex act with a minimum of conscious attention. The bench is set in order as one puts on his overcoat, quite unconscious of the steps of the process unless he meets with some unusual difficulty. But this automatic response to the sight of a tool out of place is no guaranty of a similar response when the boy sees a pencil mark out of place. A habit of neatness in the shop is

no assurance that the student will brush his coat, or black his shoes, or keep his desk in order, or abstain from defacing his text-books, or write neat examination papers.

It is, however, possible to form the habit of completing one's undertakings, of being deliberate and cautious before acting. Furthermore, if a habit has been formed, not by external constraint as when a horse is taught to stop at the word "Whoa," but voluntarily under the inspiration of an ideal, the same ideal may create similar habits in other fields. Thus if the habit of neatness has been formed from the fact that the pupil takes pride in a clean shop and an orderly bench, because of his fidelity to an abstract ideal of neatness and order, the same ideal may function in creating similar habits in regard to his clothing, his books, desk and manuscript. Now manual training leads all other school work in its power to develop fidelity to ideals because our work remains as a visual, tangible thing just as we have made it.

The argument that we have made lives only in its effect upon men's opinions; the song that we have sung dies away in the air, but our careless workmanship lives to shame us, our good work to nourish our love of excellence.

The fact that one must respect the grain of the wood that he planes and polishes, that its physical properties are ultimate facts that will yield neither to his coaxing or his entreaties, his poutings or his threats, is a useful discipline in obedience to law.

ATTITUDE TOWARD SCHOOL LIFE.

But on the habit side of character the benefits of manual training are to be found not merely in the positive discipline of the shop. Preoccupation in any form of joyous activity will banish the listlessness, the idleness, the mischief, the spirit of insubordination, that infest many of our schools, Benchwork, sewing, cooking, drawing, appeal to the student of the motor type as few of the older studies can. Every high school principal can recall instances of a radical change in attitude toward school life and school work wrought in many students by the introduction of manual training.

Two somewhat aberrant types of students receive a special benefit from manual training. The sons and daughters of the wealthy find in these fundamentally human studies the same instinctive delight as do other human beings. With this familiarity comes an appreciation of the life and interests of the toiling masses that can hardly be gained in any

other way. The changed attitude of the daughters of luxury towards the household arts wrought by courses in home economics, is a matter of universal comment.

On the other hand, among the semi-criminal there is no better way to teach the rights of property than by having boys make and own articles of use and value. The right of private property in land, or mineral veins, or water-power, sources of wealth created by the Almighty, may be and is questioned; but the right of property in that which one has made with his own hands is a fundamental right that no one questions.

The self-respect enjoyed by skilled workmen is one of the most substantial qualities of good citizenship. Longfellow's Village Blacksmith looked the whole world in the face. The free cities of the middle ages owed their democratic character and political capacity to the members of the gilds, and it is in the homes of such workmen, next possibly to our farm homes, in which our best citizenship is bred to-day.

CLASSIFICATION BY OCCUPATION.

Divide the children of your school into five classes according to the occupation of their parents. In the first put the children of the professional classes—presumably the best educated according to the standards of the schools—ministers, lawyers, physicians, editors, teachers, also the ex-teachers and ex-preachers in real estate and insurance.

In the second class place the children of the trading class, merchants, bankers, traveling men, grain buyers, ticket agents, but excluding tailors, tin-smiths, and other skilled mechanics who combine trade with manufacturing.

In the third class put the children of the farmers active and retired.

In the fourth class the children of skilled mechanics—carpenters, blacksmiths, masons, plumbers, printers, machinists, locomotive engineers, and others.

In the fifth class the children of the common laborers and of men whose occupations require little special knowledge, skill, or responsibility.

Now grade these several groups according to their scholarship, deportment, and fidelity to school obligations and note which group averages highest. I made the classification in a town of 2,000 where I knew everybody. In that case the fourth group stood highest.

You may ask what does all this prove. It probably proves nothing, but in so far as good school work is due to hereditary transmission of sterling traits of mind and character, or to the cooperation of the well-

ordered home, it indicates that men of skill in the manual arts are not inferior in mind or character to the so-called "better classes" of the community.

Thruout this paper I have discussed manual training in the most familiar meaning of the term, viz: benchwork in wood for the boys in the grammar grades and high school. But the term includes drawing, modeling, weaving, sewing, cooking, all forms of handwork other than mere writing. The educational values here discussed apply in large measure to them all. We can rate none higher than sewing and cooking for girls. The preparation of food and clothing for her family has been woman's chief occupation thru all the ages; no other school occupations approach these studies in interest and power. They introduce an intellectual and idealistic element into the daily duties of the home that saves them from drudgery.

Finally manual training introduces us to that gospel of work of which Carlyle and Ruskin and William Morris are the prophets—a gospel that brings soul, content, interest, beauty and taste, to all creative work of the hand. It promises that better day when workers will make nothing of which they are not proud, and dealers will handle only the goods they love to sell, and buyers will seek nothing but what they find delight in using.

It invests all labor with an atmosphere of joyful service, and exalts the laborer to his rightful place of dignity and honor. I cannot bring this paper to a better close than by quoting from Ruskin's Ethics of the Dust this apotheosis of the great household art:

> To be a good cook means a knowledge of all fruits and herbs, of balms and spices, of all that is healing and sweet in grove and field, savory in meats. It means willingness, watchfulness, carefulness, inventiveness, and readiness of appliance. It means much tasting and no wasting. It means the skill of your great-grandmothers and the science of modern chemists. It means French taste, English thoroness, and Arabian hospitality. It means, in short that you must always be ladies (literally loaf-givers), and see to it that we all have something nice to eat.

BOOKBINDING IN THE SCHOOL.

George William Eggers.
Oscar Lincoln McMurry.

I. THE SPIRIT OF INDUSTRIAL EDUCATION.[1]

WHEN introducing any craft into the curriculum of the public schools, it is of the utmost importance that we scrutinize carefully its educational possibilities to learn just wherein its values lie, and form conclusions as to what approach will yield most richly in return for the time spent. It is necessary to keep clear in our minds the true standard of educational potentiality, tho the subject may never have been measured by this rod before, and to ignore all other standards of measure of whatsoever sort may happen to persist around us.

There has been a movement recently to confine the meaning of industrial education to the idea of training for a given trade. There has always been in practice, and is now in nomenclature, a growing disposition to confuse industrial education—that broad idea which comprehends all use of the industries as instruments of general education—with vocational training which implies a specific training for a particular calling. The most immediate and threatening danger to industrial education in the public schools to-day is the confusion of its aims, its ideals and its methods with those of vocational training. The essays of this series then, let us hasten to say, are essays on industrial education rather than vocational training. That the difference is marked will be made clear, for upon a thoro understanding of it depends the essential spirit and method of all that follows.

The method of vocational training is of necessity allied to the method of factory work. The boy, in order to be prepared to take his place by the side of the experienced workman, must be surrounded during his training with some of the conditions and ideals which surround the said workman. The method of industrial education is in many respects the precise opposite of the method of the factory, since factory conditions and ideals do not always make for the character growth which is the essential spirit of education. This can be seen clearly enough by viewing any industry, first as a factory problem and again as an instrument of general education.

The factory sees as the goal of its endeavor an article of more or less excellence, produced in the most economical manner possible. This

means that the problem shall consume the smallest possible amount of material (for material is an element in expense), the smallest possible amount of time (for time may be an element of even greater expense), and shall involve the smallest possible amount of intelligence, for in a factory intelligence is the most costly element of all. "One good boss is worth nine men." The factory consequently hires one boss, or leader or foreman, *one head,* to do the thinking (the planning or the "laying out" of work) for the *ninety-and-nine "hands."* This leader solves two-thirds or if possible nine-tenths of the workman's problem, and automatic machinery is procured to solve as much as possible of the remaining fraction of it. It is to be noted here that it is the *thinking* problem which is thus ever being eliminated. The factory constantly needs, calls for and makes (as has often been pointed out) non-thinking, non-intelligent individuals; it takes no account whatever of the effect of its economy upon the individual character and it reckons not in the terms of humanity, for humanity is not its avowed product. All of this method is part of the legitimate and necessary economy of the factory.

HUMANITY THE CHIEF CONCERN OF THE SCHOOL.

Humanity is the chief concern of the school. The avowed product of the school is ever a finer and finer humanity. The school takes little account of the costliness of materials, little account of the time which goes into a given piece of work, provided its broadly understood educational purpose be subserved. The school glories in, as well as adds to, the degree of intelligence which it finds in its workers. "Not what you take away, but what you bring to it, will make this a great school," declares a modern educator to his pupils. So the indivdual who enters its portals to become a worker finds the school getting at problems in a way often totally different from that of the factory. The school maintains its leader too, as the factory does, only it is not the purpose of this leader to solve the problems, but *to create them.* His lying awake nights, unlike that of the factory foreman, is for the purpose of devising situations which will tax the ingenuity and intelligence of his workers, and bring forth more and more of the capacity for self-realization.

What then of the teacher in industrial education who says, "We can't get thru our course if we stop to 'develop' our problems"? Better look to your "course." Are you running a factory where a certain number of jobs have to be put thru every ten months? What of the one who says, "We can't get our work done if we allow pupils to stop and design"? Are you educating your pupils to be leaders or followers?; "heads" or "hands"?

How then shall the material of any given industry be used to bring about these ends? The teacher may see the year's work of any given grade in terms of finished projects; or he may see it in terms of the pupils' growth. As we have seen, the two are not necessarily synonymous. The teacher may present the work in one of two ways: (a) he may present the end or goal which is to be attained, *by showing the pupil a finished object or the representation of an object which is to be duplicated,* stating conditions and giving directions as to the attainment of that object; or else, (b) he may develop a need to be fulfilled, with its implication of a circle of definite conditions, *allowing the pupil to form his own image of the completed object called for in the fulfillment of these conditions.* A statement suggesting comparative possibilities in the employment of these two methods follows:

TWO METHODS COMPARED.

In the first place; with a definite end or goal set by models or representations the ultimate image is supplied, a ready-made thing; it is a fixed point beyond which there is no incentive for the capable pupil to rise, and up to which the slow one is pretty sure to be "boosted" by the moral effect of the class work and probably by the special help of the teacher. The quick pupil gets no chance commensurate with his power to grow; the slow one never becomes conscious of the need to grow: the difference between good thinking and poor thinking is not made apparent. On the other hand, when the problem is set as a circle of conditions fully understood, but without the end being actually presented, each pupil has an opportunity to rise as far as he can; there is no "lid" upon his problem; it may be as much of a problem as his ingenuity will conceive. When it is finished the whole class may see the superiority of the object which superior thinking has produced.

Secondly: With the goal set by models or representations the activity becomes chiefly a manual activity; it is not fully a constructive problem. The real constructive problem is the engineering feat, not the laborer's part. On the other hand, when the problem is set as a circle of conditions, a complete circle of human activity is involved: a need is discovered; it is analyzed; it is understood; a solution is devised; it is projected; it is worked out; the product is tested by use; it is criticised by all, and its adequacy or shortcomings understood and accounted for. Every one of these steps is big with educational opportunity. The discussions among the pupils will turn upon structural problems rather than upon technic, and the true relation between conception (or invention)

and execution will be ingrained. The experience will then be a typically constructive experience.

Thirdly. In order properly to approach this topic of our comparison certain esthetic bearings of the subject should be considered. "Art," says Hegel, "is the free and adequate embodiment of the idea in a form peculiarly appropriate to the idea itself." Every creative feat, from the painting of a picture to the building of a skyscraper may come under this definition. Within five years the American industries have awakened to the economic value of art as a part of their product and as an element in its presentation to the public. The schools may recognize these now obvious truths, but most of them have yet to discover the more occult and still more pertinent truth of the transcendant importance of the esthetic as a factor in education. Even without the conscious embodiment of extraneous artistic elements in any work, the process of invention itself is an esthetic process. As the efficiency of the object or person or work considered is increased this becomes more apparent. We hear it said of a waiter who anticipates our desires; "He has made service a fine art," and in this connection our use of the term "fine art" relates itself to the idea of extreme efficiency. If it is understood that this is the true spirt of art —*carrying on toward the ideal the efficiency of any work or operation* (and do not confuse with it the idea of mere beautification or elaboration) it will be clear to us how impossible it is justly to omit the esthetic element from consideration in industrial education. In this sense the simplest thing may be a work of fine art—it may be a mouse-trap, it may be a book-case, it may be a loom, or it may be an envelope. When the problem has been scrutinized for the maximum of its possibilities and these have been to some degree lived up to in the solving of it, the product will in its proper degree take rank as a work of fine art. Let it be noted then, that it is not the amount of manual labor expended upon it so much as it is the *kind* of manual labor, nor yet is it so much the kind of manual labor as it is the kind of *thinking* which raises anything into the realm of the ideal—not the complexity of the problem but its peculiar fitness for its purpose. When it is understood that this element pervades constructive work at every point, the importance of having the pupil conceive his work in the spirit of fine art cannot be overlooked. And so to return to our comparison of the two methods of presentation of problems in the industrial arts: *with the end or goal stated by means of a finished model or explicit representation of any other sort, there is eliminated the possibility of this esthetic experience, of perfectly adapting form and character to purpose.* Now all imagination is in a certain sense creative. But the

imaging of things never before seen, the making of combinations never before made, in other words the esthetic experience, involves a certain independence of intellect not fully appreciated by educational systems as yet. It involves a most important type of judgment, that which transcends formulated rules. Education has largely concerned itself with fitting the pupil to rules already formulated, it has given him little opportunity to act in "uncharted" realms of thought—and yet the greatest possibility of human achievement lies in these uncharted realms. When, however, the problem comes before the pupil as a circle of conditions fully understood including a definite need to be met, his imagination is at once impelled and set free—his problem is an esthetic problem. At the same time his reasoning is given absolute direction, since the *conditions* remain of imminent importance—the object when made must satisfy the need. And so, while this statement of the conditions rather than the end, gives him the widest freedom for his making of choices, it at the same time gives him an absolute criterion of judgment as to the wisdom of the choices he has made.

VALUE OF SELF-DIRECTED EFFORT.

Finally: Some who advocate the stating of the end rather than the conditions of an industrial problem, hold that only by laying emphasis on the end can standards of technic be maintained. Only by fixing a mark, they say, can pupils be made to come up to the mark. But will not the mark retain all its potency and win perhaps more, if the pupils establish the mark themselves? And again, is it not better to have them learn at once, not only technic, but the uses of technic? How would we rate the efficiency of a surgeon who "knew the use of tools," but could not diagnose a case?

The essays of this series will outline problems in the making of books, and will cover somewhat fully other problems embodied within these. Of necessity a work of this kind describes solved problems. It will be found that these problems are more or less typical and suggestive ones and that the constructive devices suggested thru them are capable of other combinations and uses than those in which they appear. Let us then be quite definite as to the use which should be made of such material. Let us remember that the teaching problem is not to reproduce this or that set of books. Such is the practice of the factory and it is not of the greatest educational import. The teaching problem is rather to discover situations (or better still, to see to their discovery) which the students may analyze, understand and meet, and in which they may find opportunity for judging the efficiency of their own solutions.

II. CONSIDERATIONS FAVORING INTRODUCTION OF BOOKBINDING IN THE SCHOOLS.[2]

The importance of bookbinding as a typical industrial art to be incorporated into the program of school studies is based upon the following considerations:

1. It furnishes a series of progressively developing problems rich in art and constructive elements. This series properly distributed thru the grades harmonizes with the growing needs of children in their use of blank and printed books and portfolios. Bookbinding from this point of view provides a completely practical and even ideal series of constructions.

2. It is designed that children shall make use of not only stock bookbinders' materials but that they shall in a supplementary way gain knowledge of fundamental processes by actually engaging in the transforming of crude materials into serviceable products, as in the making of sheets of paper by hand; in the preparing, dyeing, and twisting of cotton or flax fibers into thread; in the preparing and tanning of skins. Children may thus to some extent, with this background of experience, cultivate the habit of examining prepared materials ere passing judgment as to their quality and fitness for the service intended.

3. Constructive processes involving paper folding, cutting and pasting in the elementary problems are so primitive and free from complications (and allow so much freedom on the part of children for individuality), the materials so familiar and pliable, that children engage in them without fatigue.

Demand for increased tool technic and for materials with resisting qualities in later problems is in harmony with the general plan of development.

4. Paper continues to be a medium thru which children readily develop ideas in connection with their work or play, in folding, tearing, pasting, etc. These occupational activities catch their fleeting interests and center them in such constructions as calendars, envelopes, books for clippings, etc.

5. The book making activity in school, while satisfying the varying needs of an extensive field, looks to other activities in the school to furnish experiences sufficient to enable children to judge of the qualities of cloth, to make the various knots and stitches, construct apparatus for sewing, shaping and pressing of books, etc. It is evident from this, then, that thru the needs of bookbinding certain problems belonging to the textile and

woodworking industries may be suggested as proper to form a part of or to supplement these courses.[3] Again, when we consider that printing including typesetting and proofreading in connection with composition and spelling, is not only strongly recommended but actually in service in many schools, the close kinship of these two phases of bookmaking and printing is plain.

6. One problem in school management is the care and repair of supplementary reading and of library books (if the school is fortunate enough to have a library.) The course in bookbinding naturally provides experiences sufficient to cover the need for this kind of work in its series of problems. It should be considered incumbent upon children to make the repair of library books a part of their course. Here is an opportunity for a social efficiency test in the school.

There are opportunities for development along art and construction lines in the designing and making of gift books in the holiday seasons. Provision should be made in the course (or supplementary to it) for problems of this character, not only for advanced pupils but for younger pupils as well.

7. Inasmuch as children are engaged in the making of blank books of various kinds to satisfy individual and social needs, and inasmuch as they are interested in binding up old and new printed matter, these same children must early become judges of subject matter on the one hand and of qualities of paper, cloth, leather, character of type and marginal spacing on the other. This requires the early cultivation of an interest in good and suitable subject matter as well as an acquaintance with publishers who bring out good and suitable reading matter, printed with good type, on good paper, leaving generous margins.

8. Textile activities had a stronghold in the curriculum almost from the start. Children, especially beginners, engaged in work which could be carried on in the regular class or schoolroom with but a nominal equipment under direction of the grade teacher. Bookbinding, like textiles, can be followed out under similar conditions. Scissors, rulers, and sloyd knives are in many cases provided by school authorities. Sewing-frames

[3] It is highly desirable that children design and make the apparatus necessary for the particular work in hand, thus insuring the broadest experience possible on the part of children in invention and constructive design. This plan provides likewise for upper grade children assisting younger children in shaping the parts of constructions which the latter have designed but have had no opportunity to shape and assemble thru lack of suitable equipment, thus fulfilling a much-desired requirement, that one industrial activity shall prepare its pupils and offer its equipment to supplement the work of other school activities.

TREE BOOK. SEE DETAIL DRAWING.

BEAR BOOK. SEE DETAIL DRAWING.

BUTTERFLY BOOK. SEE DETAIL DRAWING.

and presses (together with such hammers, saws, and files as may be needed) can be secured thru the woodworking shop. The glue-pot, gas plate, and even paper cutter—one of each for an entire building—alone require special effort in the attaining.

9. There is a distinct advantage in using the materials required by the regular bookbinders rather than the scrappy "hit-and-miss" materials picked up at random, inasmuch as children and teachers are held to the standard requirement that suitable materials must be available if good designs and constructions are to work out into serviceable, tasteful products. These materials ordered from regular supply houses, even at retail prices, can be furnished to the school at an expense per pupil which will cause little if any hardship.

GROUPING OF BOOKS TO BE MADE AND BOUND.

We notice, under paragraph 1, above, that bookbinding furnishes a series of problems rich in art and constructive possibilities or elements, (elements to be found both in blank and printed matter), and that this series of problems proposed for solution, is readily suited to the needs and developing powers of children.

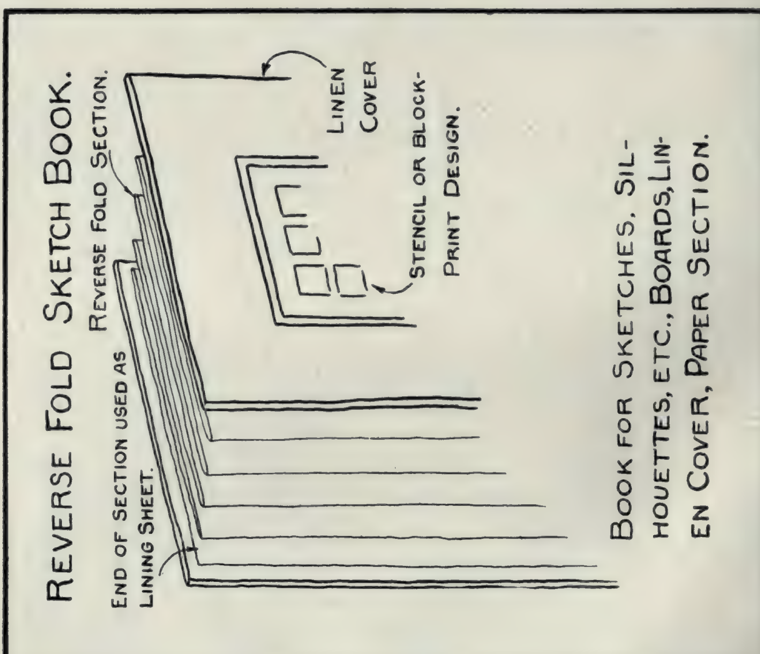
We may think of the books in this series as falling into divisions or groups controlled by some fundamental structural idea.[4] We may think of some books in the series as made up of sheets folded and gathered into one or more divisions held together in one of several ways. Such books may for convenience form Group I.

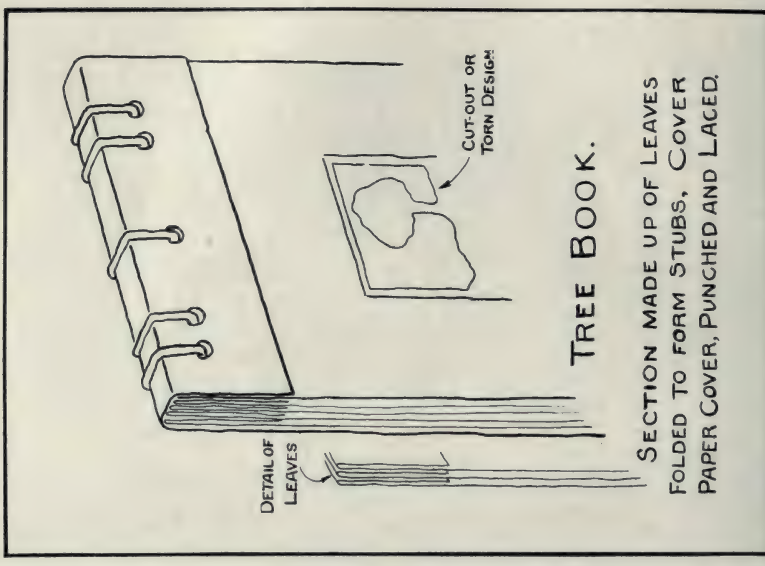
Other books, made up of sheets unfolded, gathered together and secured in one of several ways, constitute Group II.

These two groups may have their leaves bound together in such manner as to permit of the insertion or removal of leaves at will or of allowing no readjustment. Permanent and detachable covers of various kinds have been designed—in some cases made complete and separate from the books before encasing them—in others built up with the book piece by piece.

There is a series of constructions, very necessary to children in caring for their samples of materials and sketches, which while they have the earmarks of books, cannot, strictly speaking, fall withing the limits of Groups I or II.

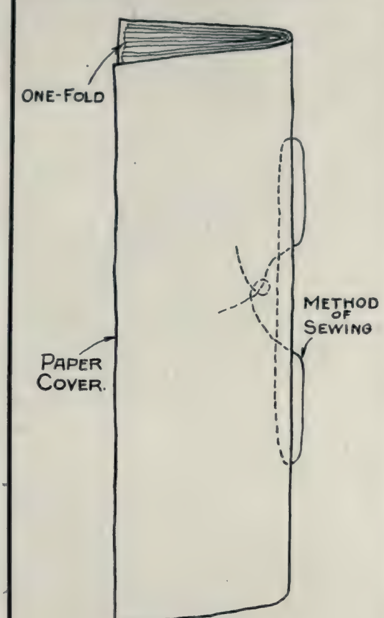
[4] Students of bookbinding are encouraged to make their own grouping, in arranging a series of developing constructions. The grouping outlined below suggests but one of several possible arrangements.


Reverse Fold Sketch Book.
Reverse Fold Section.
End of Section used as Lining Sheet.
Linen Cover
Stencil or Block-Print Design.
Book for Sketches, Silhouettes, etc., Boards, Linen Cover, Paper Section.


Cut-out or Torn Design
Detail of Leaves
Tree Book.
Section made up of Leaves Folded to form Stubs, Cover Paper Cover, Punched and Laced.

These constructions not only supplement the work of bookbinding in the application of art and construction principles, but also make use of book materials in the solution of the problems. We are inclined, therefore, to constitute Group III, the series of problems involving the development of the portfolio. These constructions, like those of bookmaking, may call for increasing complexity of detail corresponding to the needs and abilities of children.

It may be stated that one book in its development (we learned above that books are divided into groups by reason of structural features) is not necessarily fundamental or preliminary to another group. Children design and construct books in response to needs or interest, without regard to whether they fall under one group or another.



WORD BOOK.
SINGLE SECTION BOOK.
COVER PAPER COVER.
SIMPLE SEWING.

PROBLEMS FORMING THE FIRST GROUP.[5]

Books may be made of sheets folded to form:

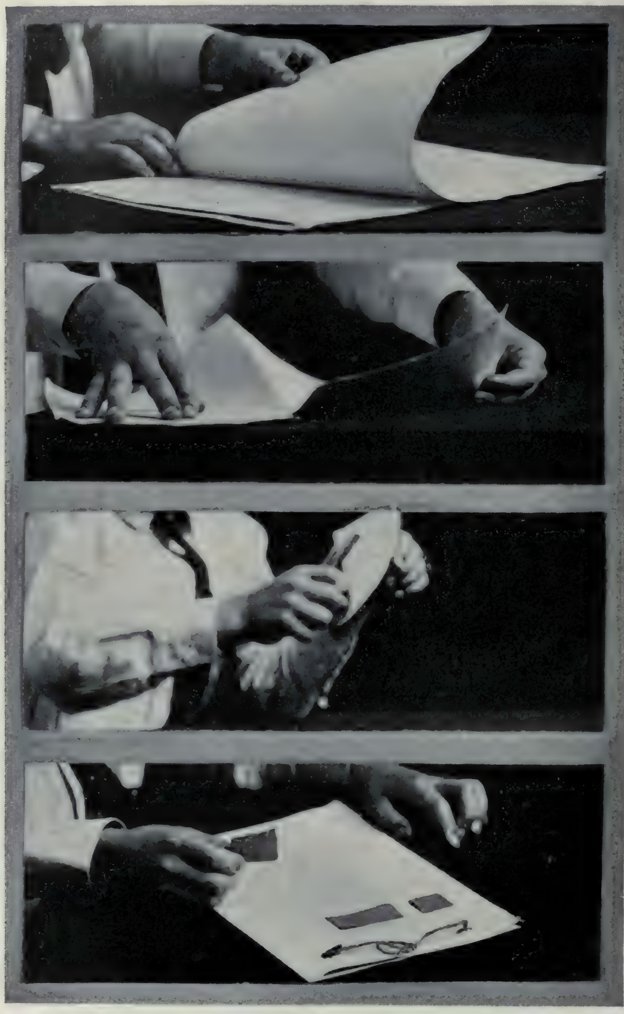
A. One-Section Books.

1. Word Book (Grade 1.) Selection of papers for cover and book as to color and texture; thread —its color, kind and size (number); folding for size and proportion; securing of sheets, spacing for stitches or lacings; knotting; decorations on cover by paper cuttings or tearings; placing.[6]

[5] These problems in connection with design offer experiences in the fundamental operations—folding, tearing, sewing, punching and pasting.

[6] Children have a preliminary problem in preparing samples of book and cover papers, cloths, thread, and boards, together with the designing and making of envelopes in which to place and label them. These samples are invaluable in matters of color and textures in connection with design. Hence every child should have his own samples. As materials are used up and new supplies provided, the envelopes may be overhauled, discarding the old samples for the new.

2. Tree or Pear Book[7] (Grade II), for pasting pictures or clippings. Texture and color for book and cover papers; cord made of twisting of threads.[8] Book to be considered as to size and proportion, with reference



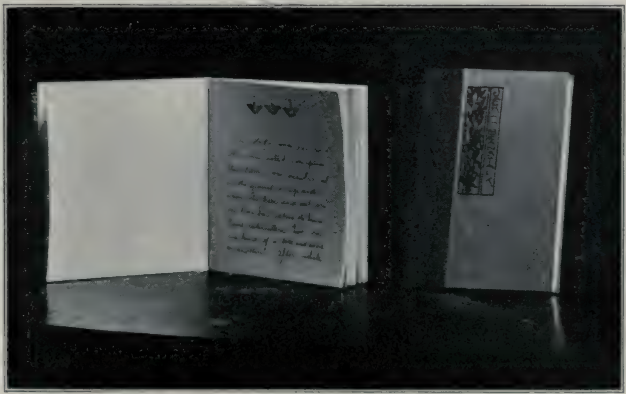
FOLDING, TEARING, SEWING OR PUNCHING, DECORATING.

[7] The names of books given are those suggested by children in their work. Children are free to select names for their books.

[8] One of the fundamental experiences which children should gain is in preparing the cotton or flax fibers and twisting them into threads and making cord by twisting together the threads.

TWO-NEEDLE SEWING.

ADDRESS BOOK, OR HOLLY TREE INN. SEE DETAIL DRAWING.

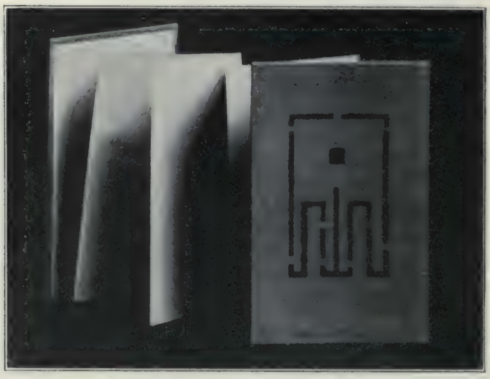


JACK AND BEANSTALK. SEE DETAIL DRAWING.

to its service. Two-piece cover with flap in contrast with single fold cover. Decoration by spacing and lacing together with torn or cut paper designs. Purpose of stubs made by folding sheet into long and short leaves.

3. Bear or Hallowe'en Book[9] (Grade III), for sketches or compositions by children. Sketching for size and decoration; crayon or water-color designs for cover; flexible covers built up with manila paper for boards; cloth hinge and cover papers; edges trimmed or not.

4. Butterfly Book (Grade IV). Records of study of butterfly. Size and materials and decorations suitable; board covers for permanent records; built-up covers piece by piece; trimming of book and covers.



REVERSE FOLD SKETCH SILHOUETTE BOOK.
SEE DETAIL DRAWING.

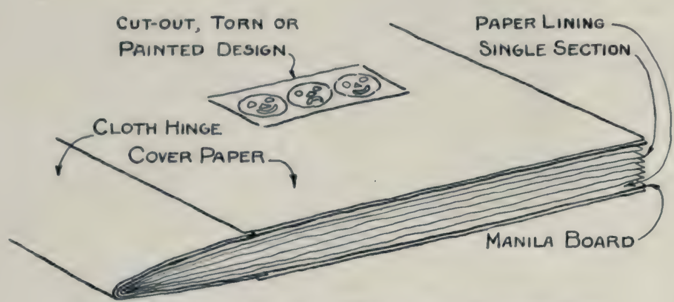
5. Printed Book (Grade V), as Jack and the Beanstalk. Consideration of quality of paper; size and design of type; size of margins; paragraphing; purpose and name of blank leaves at beginning and end of book. Boards for covers to have edges covered; patterns for cloth hinge and cover paper sides; mitering corners. Design for title—its size, lettering, placing. Testing for proper cutting and placing of boards on book. Pressing.

6. Silhouette or Sketch Book (Grade VI). Reverse-fold section; quality of paper, cloth, boards; design for cover. To stiffen boards; to straighten boards tending to warp; to reinforce folds (reverse) to insure better service. Paste for use in book-making; wet paste, dry paste; care of paste.[10] Materials for making of design—water color; oil colors; mixing of colors, placing.

[9] Hand-made paper is valuable—the processes thru which the crude materials are put are elementary enough for children to engage in them intelligently.

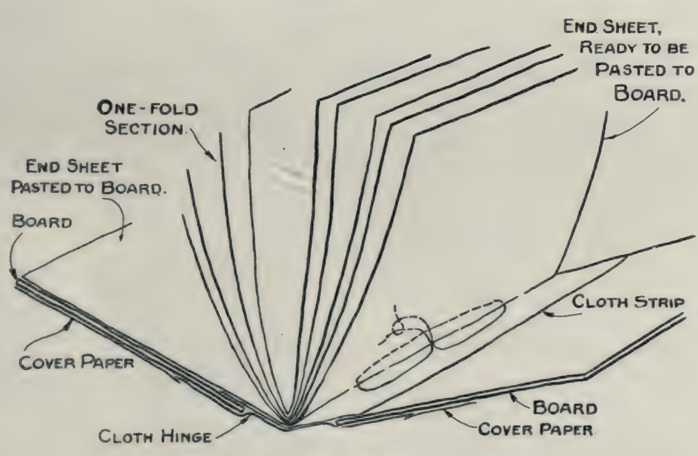
[10] Making of Paste—Wet Paste—Flour; making of batter, mixing in proper amounts of preservatives as powdered alum, oil of wintergreen, and glycerine—purpose of each; boiling, stirring, and beating; placing in receptacles; storing. Dry paste—Flour, Starch, preservatives. Purpose of wet paste; of dry paste. Prepared pastes on market—good points—objections.

BEAR BOOK. ALSO HALLOWEEN BOOK.



ONE SECTION BOOK, TRIMMED EDGES, MANILA BOARDS, CLOTH HINGE, COVER PAPER SIDES, PAPER LINING, & THREE FOLD SEWING.

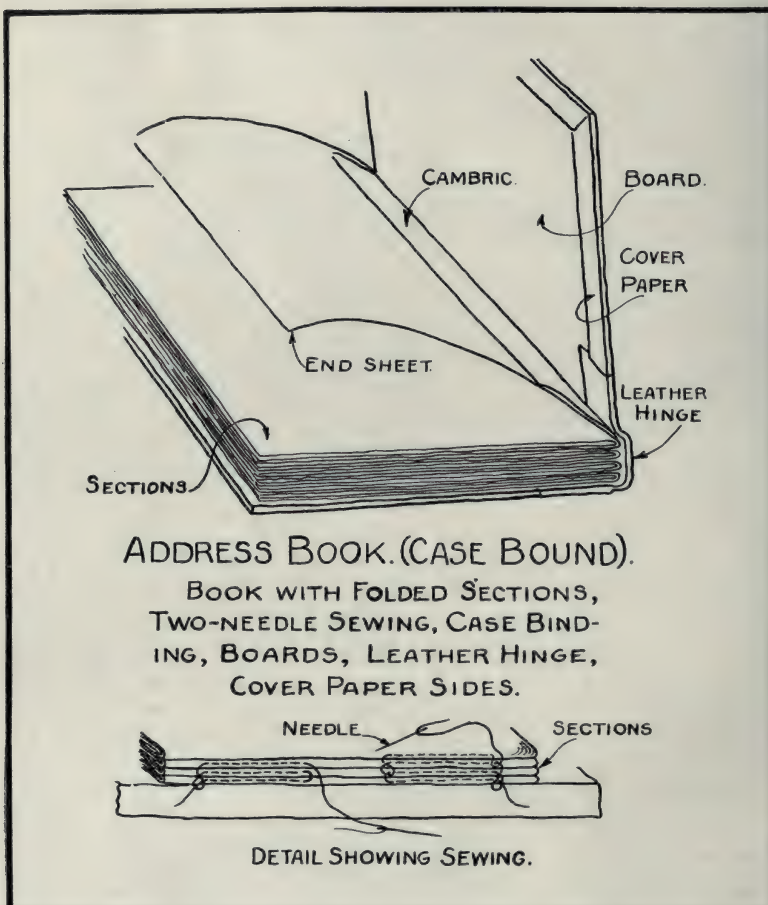
BUTTERFLY BOOK:



BOOK WITH FOLDED SHEETS. ONE SECTION. BOARDS, CLOTH HINGE, AND PAPER SIDES. TRIMMED EDGES AND THREE-FOLD SEWING.

B. Several Section Books.

7. Address Book, or Holly Tree Inn (Grade VI). Selection of writing paper for address book; proportions suitable; texture of materials for board covers; case binding; leather for hinge (and corners); quality



ADDRESS BOOK. (CASE BOUND).
BOOK WITH FOLDED SECTIONS, TWO-NEEDLE SEWING, CASE BINDING, BOARDS, LEATHER HINGE, COVER PAPER SIDES.

and finish. Sewing of several section book with two needles; gluing back; shaping of back; pressing.

MATERIALS.

In estimating and ordering supplies suitable for needs of school in working out a series of problems, one should have some knowledge of

terms applied to stock materials and the manner in which supplies are delivered as in packages, bundles, skeins, spools, etc., in standard weights and sizes.

Paper.[11]—Flat writing, common pen and pencil note, in standard weights and sizes.

Linen bond, pen and ink note of high grade. (Light weight bond for guarding and repairing books.)

Book paper for pen and pencil notes, for end papers, and for print papers.

Kindergarten papers in colors, for cutting and tearing.

Sketching paper in tints.

Cover papers, rough, in crash or antique finish. Cover papers, smooth in laid or enameled finish, in great variety of colors.

Manila, in light, medium and heavy weights, for cover paper and flexible board.

Boards.—Jute, straw, cloth, and tar boards—low numbers for thick boards—high numbers for thin boards, in standard weights and sizes, in bundles.

Cloth.—Book cloth, buckram, in light and heavy weights, in many colors; 38 inches wide; by yard or roll.

Linen, pure, or mixed with cotton or jute.

Pongee silk, in 27 inch and 36 inch widths. These cloths are used for covers and linings of books.

Muslin, lawn, cambric and linen may be used for lining of hinges, flaps, etc.

Threads.—Linen, by the pound, in skeins, balls, or spools, for sewing.

Silk in skeins and spools, for sewing and making head bands.

Embroidery silk, in skeins, for cord making and embroidery work.,

Silk floss, in skeins or spools, for head bands and lacings.

Macreme cord in balls for book lacings.

Tapes.—Cotton and linen, narrow and wide—necessary to dye to get suitable colors.

Leather.—Buffing, in sides or hide, in many colors and finishes.

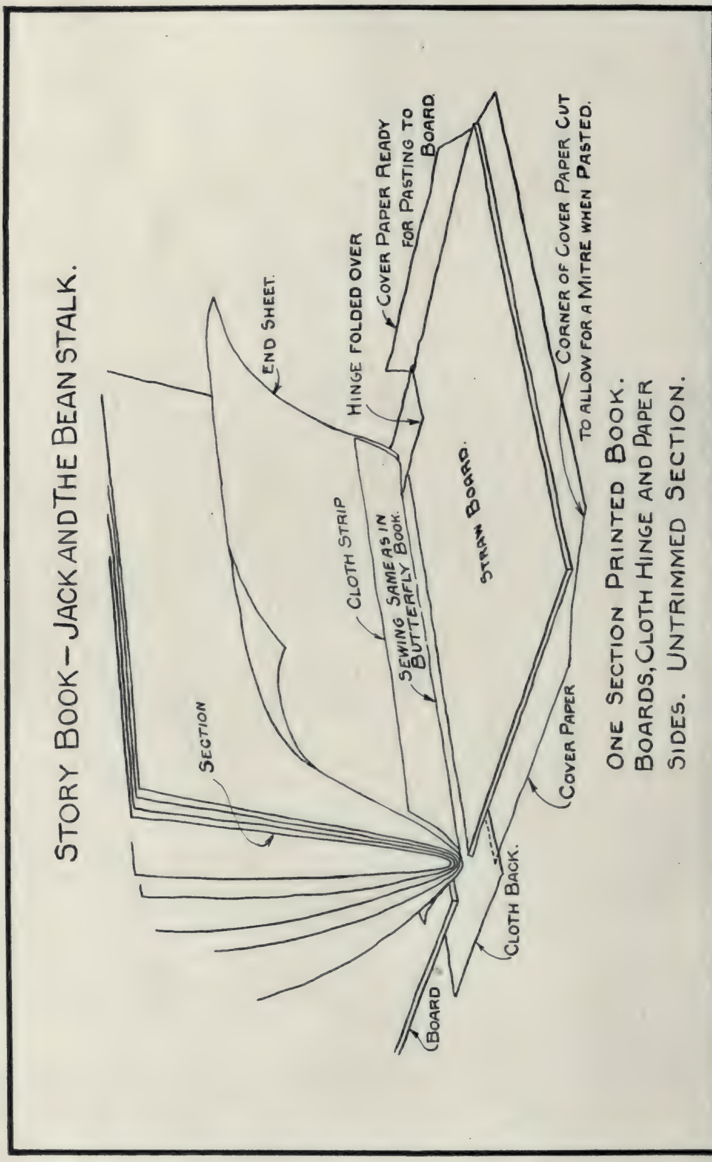
Skivers, in skins in many colors.

Glue.—Hide glues, ground and sheet, by the pound.

Paste.—Flour, made or prepared.

Library, made or prepared.

[11] *Paper,* for writing and printing. Boards of different kinds may be ordered from the paper houses. *Book cloth,* leather, lithograph lining papers, glue, etc., may be obtained from bookbinders' supply houses. Linen silk, macreme, floss, thread, tapes, etc., may be bought in the dry goods stores, department stores or notion stores.


STORY BOOK—JACK AND THE BEAN STALK.
END SHEET.
HINGE FOLDED OVER
COVER PAPER READY FOR PASTING TO BOARD.
CORNER OF COVER PAPER CUT TO ALLOW FOR A MITRE WHEN PASTED.
CLOTH STRIP
SEWING SAME AS IN BUTTERFLY BOOK.
STRAW BOARD.
SECTION
COVER PAPER
CLOTH BACK.
BOARD
ONE SECTION PRINTED BOOK.
BOARDS, CLOTH HINGE AND PAPER
SIDES. UNTRIMMED SECTION.

Tools. Letter presses, with 12 inch by 16 inch plate, may be purchased second-hand at reasonable rates. The problem of the press is suggested as a suitable one for the upper grades to design and execute. Some have been worked out on the principle of the wedge, others on that of the screw.

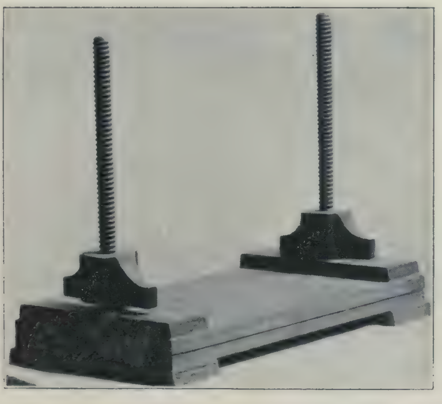
Glue-pot (1 qt.), enameled iron, together with boiler.

Gas-plate, single burner, and 10 feet of rubber tubing. These may be had at hardware stores or department stores.

Needles. Tape needles, in packages of 10 each.

Sewing needles, in packages of 25 each. Needles may be obtained in notion stores.

(*To be continued.*)



BOOK-PRESS.

VISITING MANUAL TRAINING SCHOOLS IN EUROPE.

VI.—ST. ALBANS AND LONDON.

CHARLES A. BENNETT.

ON returning from Scotland I visited more schools in London and completed my short trips out of the city to the schools and men whom I wished to see. Among such trips I recall with special pleaeure the two that I made to see St. Albans, where I was the guest of James T. Bailey, instructor in manual training at the St. Albans School, head master of the St. Albans Technical School and Secretary of the National Association of Manual Training Teachers.

FIG. 73. THE MARTYR'S PATHWAY, ST. ALBANS.

St. Albans is about twenty miles out from St. Pancras station on the Midland Railway. It is beautifully situated on an easily sloping hill—the highest point in Hertfordshire. The entire hill, as seen from the railway, is covered with the buildings of the city partly hidden by many trees, and crowned at the top with the noble cathedral, the historic abbey church of St. Albans. At the foot of the hill thru broad fields—green even in February—flows the sluggish waters of the Ver, beyond which are still to be seen some of the ruined walls of the ancient Roman town of Verulam. The first view that one gets of the city is one that appeals to the eye and to the imagination also if he has learned the history of the place, for St. Albans was named for the first Christian martyr in England. Briefly told, the story is this:

In the reign of Diocletan a native of Verulam named Alban gave "shelter and hospitality" to Amphibalus, a deacon of the Christian church, and soon became a convert to the Christian faith. When the Roman

agents of the Emperor tried to capture Amphibalus, "Alban enabled him to escape and thus brought upon himself the death from which he had, for a time, rescued his friend." Alban was taken outside the walls of the city along a path that still remains, Fig. 73, across the river Ver,

FIG. 74. THE OLD GATEWAY, ST. ALBANS SCHOOL.

and up to the top of the nearby hill where he was beheaded. This was in 304 A. D. In a few years Christianity had gained such headway in this ancient town that a church was founded in honor of Alban and very appropriately located on the spot where he had suffered. Gradually, as time went on, the new town of St. Albans was built on the hill around the site of the martyrdom and the Roman town on the other side of the Ver was forsaken. It is interesting to know that in the same degree that the native citizens of Veralum had been noted for their fidelity to the service and interests of the Romans, having on that account been accorded privileges equal with the Romans themselves, so under the new religious impulse the inhabitants of St. Albans became zealous in the propagation of Christianity thru the church and its ally in the Christian School.

There is little doubt that St. Albans School established in connection with the abbey, supposedly in A. D. 948, is the oldest educational foundation in England. "In the year 1195 it is recorded that it had a greater number of scholars than any school in the Kingdom. Under the fostering care of the abbots of St. Alban's monastery it became endowed with

special privileges, and many distinguished scholars received their education within its walls." During the three centuries after the Reformation the school was held in the Lady Chapel of the Abbey, and it was here that Francis Bacon, Viscount St. Albans, received his early education and preparation for Cambridge University. At the present time the school occupies the old gateway, Fig. 74, which is a corner of the monastery buildings erected in 1365, and some excellent modern additions, only one of which is shown in the illustration. Guided by Mr. Bailey I entered the door at the base of the octagonal tower, Fig. 74, and passed up a narrow spiral stone stairway within the tower. The steps of the stairway were badly worn by the feet of centuries of schoolboys. On the second floor we came to the little old library. It was such a room as one would like to sit down in and read of Alfred the Great, Richard the Lionheart, Henry, Stephen, and all the rest. Going up to the very top of the tower we found an entrance into a half-lighted strange-looking room with a post in the center. If legend be truth, this is a veritable torture chamber, the central post a whipping post, and the tiny fireplace in the side of the room the place where the hellish irons were heated. It seems quite fitting that this room is now used as a property room for the dramatic club of the school.

Passing down the stairway again and inside the great gate, the headmaster of the school, E. Montague Jones, completed the chapter begun in the torture chamber by showing me the prison cell with barred windows and the dungeon. He unbolted a heavy door, took me into a dark room, lifted up some planks in the floor and bade me look in. My imagination began to work and I did not care to investigate deeper down. It was enough for me to know that it was a black hole fifteen feet deep and that in olden times all they had to do to get rid of an offender was to drop him in, replace the planks and bolt the door. The headmaster assured me that the dungeon had not been in use for many years. On the second floor above was a well equipped manual training shop. He did not say that this shop and his excellent gymnasium were a substitute for the whipping post and the dungeon, nor did he say that these latter were ever used for school purposes at St. Albans, but I could not help thinking that manual training, which, to a degree, at least, is a fair embodiment of the modern theory in education, is rapidly pushing back into very remote antiquity such clumsy and grewsome means of guiding the human spirit. Of all the great public schools of England St. Albans is the oldest and, what is doubtless more interesting to our readers at this moment, it is the first to recognize fully the value of manual training by

FIG. 75. MANUAL TRAINING ROOM, ST. ALBANS SCHOOL, SHOWING THE UPPER PART OF THE KING CHARLES FIREPLACE.

establishing a modern school shop and employing a trained and experienced manual instructor. More than Eaton and Rugby and other schools of this class, St. Albans has broadened its course, giving much attention to science, mathematics and manual training. It is therefore especially qualified to fit boys for the newer English universities and the colleges of engineering as well as for Oxford and Cambridge .

I visited the manual training shop when a class was at work under Mr. Bailey, and was permitted to take the picture shown in Fig. 75. To me this room was a charming intermingling of the new and the old—modern manual training teachers in a room more than five hundred years old, up-to-date light fixtures in a room with a great fireplace bearing the coat of arms of King Charles, modern tools and models on the benches while the carved corbels holding up the large brackets on the sides of this famous old room and the one adjoining were the product of medieval craftsmanship, probably representing personages living in the ancient monastery or such others as might be considered desirable companions—a crusader and an angel, for example. As soon as the class had left the room I took another picture, Fig. 76, showing more clearly the design of the work-bench used. The closet in the end holds the bench outfit of tools, each tool having a definite place. Under the bench are eight pigeon-holes with removable fronts which are held in place at each end of the bench by vertical strips of wood hinged to the posts. These strips can be fastened at the top with lock and key. The top has a tool-tray at the back and a vise at the right-hand front corner. Each bench is provided with a drawing outfit; a closet at the side of the room contains the extra tools.

The general spirit of the class in this room was excellent. In some English school shops I had felt that there was an unnecessary atmosphere of suppresion and submission, but not so here. On the contrary there was an atmosphere of freedom and self-control, enlivened with enthusiasm for the work and made fragrant with an evident good comradeship, and manly courtesy. How much of this was due to the course, how much to the teacher, and how much to the general conduct and traditions of the school I could not tell, but I can readily believe that each was an important factor. Here as well as at the Technical School Mr. Bailey was teaching the thought-stimulating course outlined in his "Woodwork for Schools on Scientific Lines." This course is made up of useful models, including a large number of pieces of science apparatus. The steelyard shown in Fig. 77 is one of the earlier pieces. The aim in this course is to link the classroom with the laboratory and workshop, thus

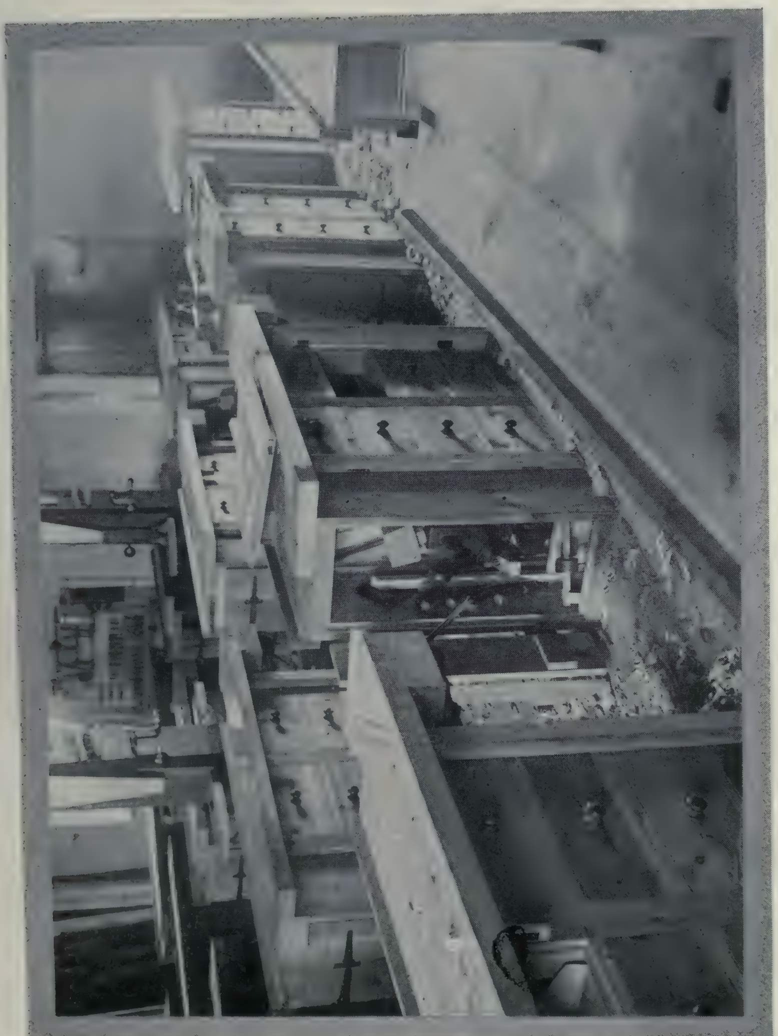


FIG. 76. BENCHES IN MANUAL TRAINING ROOM, ST. ALBANS SCHOOL.

bringing into correlation mathematics, science, drawing and woodworking. Instead of centering the interest of the boys on making things useful for their homes, the obvious aim is to concentrate the attention of the pupils on the work of the school.

St. Albans seems to have found a happy solution of one of its school problems by bringing its public library, its technical school and its art

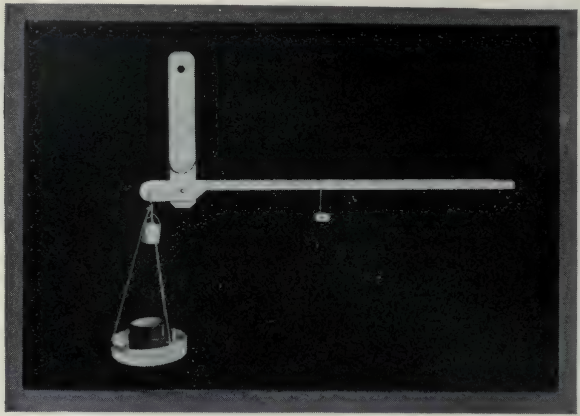


FIG. 77. MANUAL TRAINING MODEL, ST. ALBANS.

school into the same building. This building is therefore an educational center for adults as well as youth, both daytime and evening. The rooms of the technical school are badly crowded, but the art school has three excellent rooms. Robert E. Groves, head master of the art school, assisted me in taking two pictures, Figs. 78 and 79, showing the equipment of two of these rooms. The simplicity and convenience of the furniture interested me, but especially I was attracted by the excellence of the work being produced by the students. Altho St. Albans is a small city, its art students are receiving instruction fully equal to that given in most of the larger centers of population.

Of my other short journeys out from the center of London little need be said here tho each had its special pleasure and value. I shall never forget the day with Mr. and Mrs. J. C. Hudson at their delightful Home School for Boys and Girls at Highgate. There, in a fine old mansion, in one of the healthiest suburbs of London, surrounded by trees and lawn and garden live Mr. and Mrs. Hudson with their own children and several others besides, under conditions for child culture seldom equalled. Nature, art, music, literature, history, work, play, and mother

FIG. 78. ROOM FOR FREEHAND DRAWING AND DESIGN, SCHOOL OF ART, ST. ALBANS.

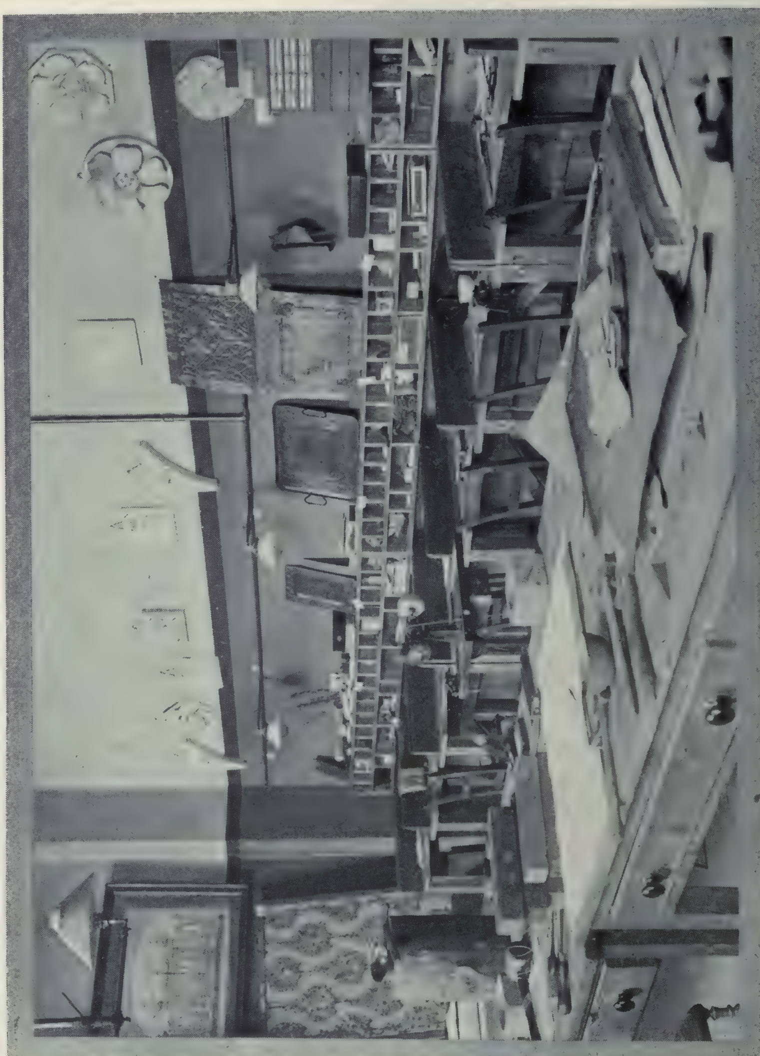


FIG. 79. ARTS AND CRAFTS ROOM, SHOWING METALWORKING EQUIPMENT, ART SCHOOL, ST. ALBANS.

love all unite to do their best. I was reminded of a friend who looking at a little girl coming into a street-car one spring morning said to me, "There is nothing so beautiful as a sweet little girl." I agreed with him, but now I believe I could get him to revise his decision if I were to

FIG. 80. CENTRAL SCHOOL OF ARTS AND CRAFTS AND DAY TRAINING COLLEGE, LONDON.

show him a whole garden full of such girls with some fine little boys mixed in. Such is my memory of the Home School at Highgate. The handwork in the school is not at all of the formal type. I recall a tool house that had been constructed in the corner of the garden and some exceedingly interesting inventional problems that have been wrought out in harmony with the life and needs of the school home.

Just before I left London I became very much interested in the schools of arts and crafts, maintained by the London County Council. The most important of these schools are the Central School of Arts and Crafts on Southampton Row, Fig. 80, and the Camberwell School of Arts and Crafts, Fig. 81. These are day and evening technical schools giving instruction in those branches of design and manipulation which bear on the more artistic crafts and trades. They also supplement the workshop practice of the various industries of the neighborhood. The Council is

assisted in the management of these schools by advisory committees of trade experts. In referring to these schools in a pamphlet on "The Organization of Education in London," Mr. Blair, the Executive Officer of the London County Council, says:

"The great majority of the students attending these schools are evening students who are engaged in commercial or industrial pursuits in

FIG. 81. CAMBERWELL SCHOOL OF ARTS AND CRAFTS.

the daytime. There is, however, a steadily growing number of day students who are either preparing to take up industrial work or who are already so engaged, and are able to attend day classes by permission of their employers. The trade classes which constitute the bulk of the evening work are, as a rule, confined to *bona fide* workers of the respective trades. The fee for these classes is small and in the Council's own institutions apprentices, improvers, and learners under twenty-one years of age are admitted free. The day work covers a wide field and includes courses for students working for their degrees; art classes for training designers, teachers, and skilled craftsmen; pre-apprenticeship classes for boys entering such trades as engineering, building, silversmithing, and

cabinet-making; trade classes for girls in dress-making, waistcoat-making, upholstery, corset-making, millinery, ladies' tailoring, and photography; and domestic economy classes for girls and young women."

As the Central School building was new and recently equipped I wished to obtain photographs of some of the rooms. None had yet been

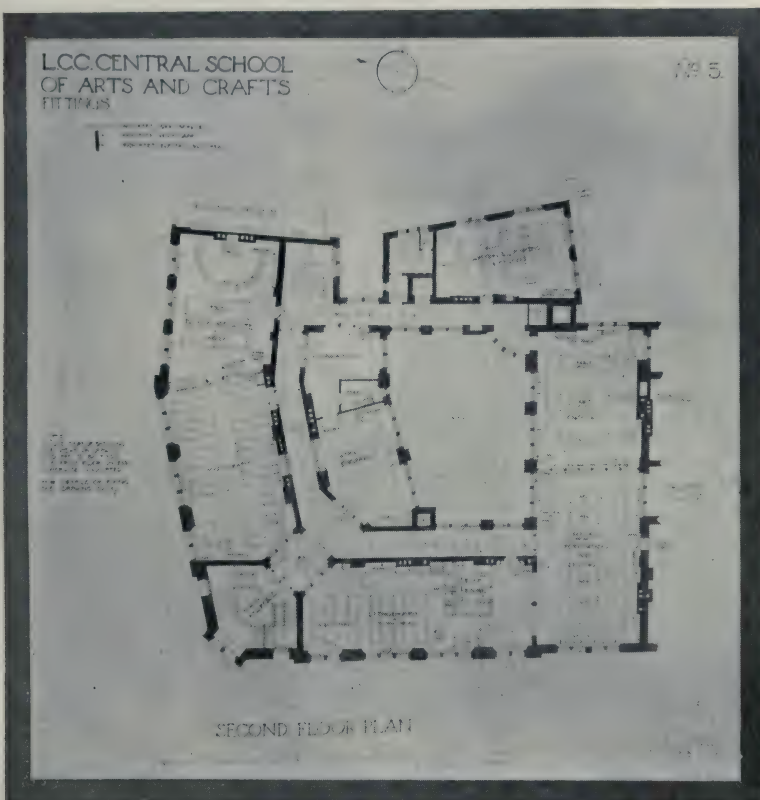


FIG. 82. SECOND FLOOR PLAN, CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

taken, but thru the kindness of Mr. Blair I was granted permission to take some myself, including one floor plan, Fig. 82, which I wanted in order to show the general arrangement of the rooms. The building occupies a space a little more than a hundred feet square. It has a basement and six floors above, providing about fifty thousand square feet of floor space. In the basement are the rooms for the heavier work, such as leadwork, stone-cutting, ironwork and metal casting, also the heating

FIG. 83. WOOD-CARVING ROOM, CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

FIG. 84. SILVER WORKERS' SHOP, CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

FIG. 85. DESIGNING ROOM FOR METALWORK, CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

FIG. 86. BOOKBINDING ROOM, CENTRAL SCHOOL OF ARTS AND CRAFTS, LONDON.

plant. On the ground floor are the administrative offices, library, class-rooms for architecture and wood-carving and gilding, Fig. 83, and a large central exhibition hall lighted by a dome. On the first floor above the ground floor are grouped together the rooms for goldsmiths, silversmiths, Fig. 84, chasing, enameling, and designing for metalwork, Fig. 85. On the second floor are the rooms for book-making, including typography, illustrating, illuminating, lithography, engraving, and binding, Fig. 86. The third floor is devoted to a similar group of rooms for the furniture trades, and the fourth and fifth floors to drawing, modeling, painting, art needlework, art glass work, and design. The building will accommodate about nine hundred students at one time.

I was unfortunate in not seeing many classes at work in the school and equally so in not meeting Professor W. R. Lethaby, principal of the school, whose writings are well known in America, but I did see some interesting work in process in the cabinet-making shop and the wood-carving and gilding shop, where they were designing and making individual gilt frames for pictures, with the hope of raising the standard of artistic framing in London. I saw classes at work in modeling, drawing and glass-painting, and, on the whole, saw enough of the school to be most favorably impressed with the exceptional opportunities offered. At the Camberwell School I was more fortunate, being there during an exhibition of the work of the school. Metalwork, stone-carving, bookbinding, and work in a great variety of other arts and crafts were shown. In going thru the rooms I was especially attracted by the work in stone masonry. The models made by the students, Fig. 87, involved the solution of many of the most difficult problems of the craft. To me these schools of arts and crafts seemed to offer many helpful suggestions to Americans interested in technical education.

Any account I am able to write of my visit to English schools seems very empty compared with the real experience. The camera helps a little but not very much, because the experiences which I prized most were with men, and not with models and equipments. The personalities of these men and the free interchange of thought gave color and added meaning to all I saw. For example, I recall a delightful evening spent with John Cooke, secretary of the Educational Handwork Association, in his home at Shepherd's Bush. Perhaps this stands out stronger in my memory because of years of occasional correspondence with this man who has been the backbone of the sloyd movement in England. He has certainly done a great work in the interests of sound methods in teaching handwork. I also recall a Sunday afternoon at Hampstead with H. Williams Smith,

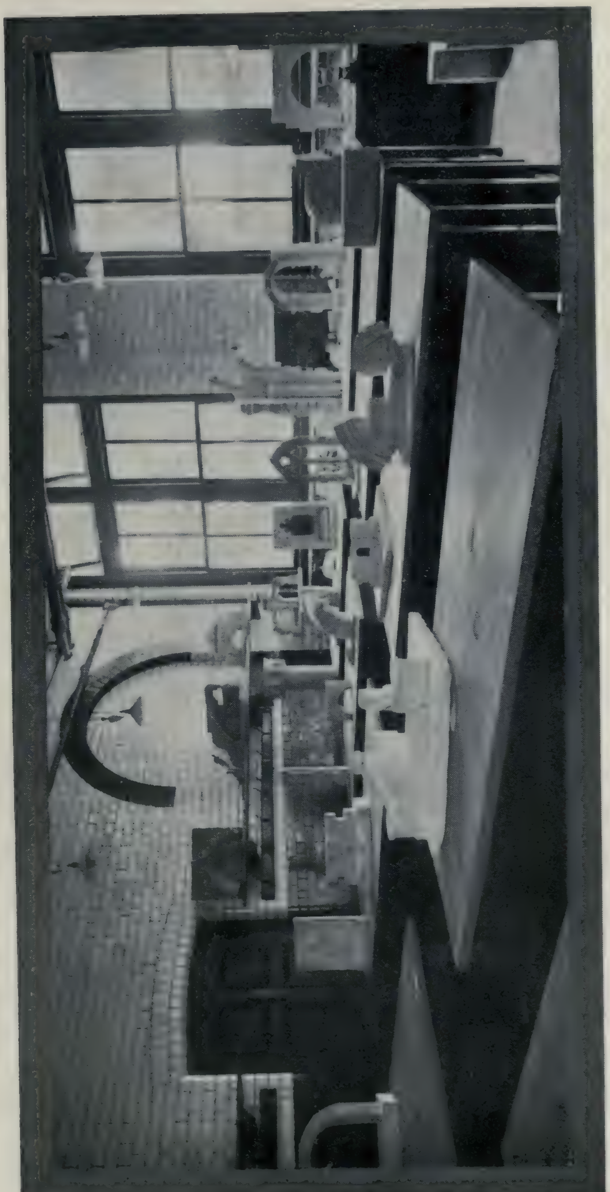


FIG. 87. STONE MASONRY ROOM, CAMBERWELL SCHOOL OF ARTS AND CRAFTS, LONDON.

editor of *Manual Training,* when we roamed over Parliament Hill together, after he had regaled me with quaint gleanings of wisdom from his unique library. Another rare evening was spent around a table with Solomon Barter, John Cooke, Williams Smith, J. T. Baily and Walter H. Nevell. But especially I recall, and with grateful appreciation, the evening I was the guest of the London Branch of the National Association of Manual Training Teachers. This occasion was a dinner given to express the cordial feelings of the London manual training teachers toward their American brethren in the same field of activity. Here I met the vice-chairman of the Branch, Mr. Moss, Evan Ortner, W. Pearson Smith and a score of other leaders and representative teachers of handicraft in London. Impressions gained on such occasions cannot be fully transmitted thru the printed page. I may say, however, that in my case they were the means of convincing me that manual training has a vital hold on educational work in England. It is carried on by a body of live, progressive men who are bound closer together than such teachers are in America, even tho they are yet divided into two camps. Their work is sure to progress, and I believe rapidly, in the near future.

(To be continued.)

THE PLACE OF INDUSTRIES IN PUBLIC EDUCATION.[1]

CHARLES R. RICHARDS.

THE report upon the Place of Industries in Education submitted to the Council is confessedly in one respect at least not comprehensive. It is written by schoolmen and deals solely with schools. This means that it represents, almost inevitably, a common weakness of such studies in that it discusses a part of a whole process without setting forth the nature of the conditions, limitations and results that obtain in the other part.

In other words, the present day problem of industrial education is one that cannot be adequately dealt with by the school alone. It is an affair in which the largest element is the training, experiences and development obtained in commercial practice and in which the office of the school is either supplementary or preparatory.

To make the school an effective instrument in industrial education we need to place it in intimate cooperation with the industrial situation. To do this wisely and successfully we need to know as schoolmen much more about industrial conditions. We need to know more about the exact conditions under which boys and girls enter the industries, the nature of the educational influences that surround them in the learning period, and the limitations of these influences.

The data that we need is not a matter of generalization for in an exact sense there is no general problem of industrial education but a thousand specific problems. To meet the situation intelligently and successfully we need to know the conditions that the learner faces in all the important industries of the country.

MORE DEFINITE DATA NEEDED.

We need to know the degree of specialization or division of labor represented in each trade; the proportion of unskilled, low grade skilled and high grade skilled workers and nature of the tasks performed in each grade; the wages of workers in each group; whether the trade is

[1] Introductory address of Professor Richards in presenting the report of the Committee on the Place of Industries in Public Education to the National Council, Boston, July 2, 1910.

localized or general in its distribution. We need to know the qualities demanded in workers such as strength, endurance, intelligence, accuracy, quickness and artistic feeling, and most particularly we need to know the conditions under which beginners enter the various trades and the influences that surround them; whether they are confined to a narrow range of operations leading only to low grade and low paid positions or whether they have opportunities for a broader range of experiences and the chance to develop into high grade work; whether the tendency is to reduce them to a cog in a machine or whether the influences are such as to stimulate intellectual growth and ambition.

Such data is not at the present time available. It exists only in piecemeal. For its development we must rely either upon comprehensive investigations undertaken by state or national government or upon local studies of particular situations. The need of such data is vital in the present situation. We still talk of industrial education in purely general terms but until the school provisions of a locality shall bear an exact and intimate relation to the needs of its particular industrial community we shall not have industrial education in any true sense.

We have heard much of late years concerning the schools of Germany, but we have not yet had in any full sense an exposition of the German scheme of industrial training. The fundamental fact, and the fact that constitutes the essential strength of the German system of industrial education, is that it is primarily an adjustment of school instruction to the conditions of the shop and factory. Not until we know the facts as to the training of the young worker in the industries, and the way the school dovetails into this training, shall we have the full story of German industrial education. Not until we appreciate the work that the German government has done to restore and to sustain the influence of the old gilds, and thru them to protect, advance and safeguard the apprenticeship system and other methods of industrial training, shall we understand rightly the German attitude towards industrial education. Industrial education in Germany is never a generalized affair. It is always a studied attempt to supplement and round out the training obtained in some specific trade up to the needs of advanced modern industrial practice.

Furthermore, and a very significant fact to us, a large number of the industrial schools of Germany are directd and largely supported by trade gilds or associations, and when this is not the case, such associations often have a very large influence in their control.

While we have this great principle of coordination to learn from Germany, it is very true that conditions in this country differ so materially

from those of the older nations that our specific institutions for industrial education must necessarily take on different forms and methods.

In Europe, particularly in Continental countries, a boy's career is virtually fixed by his family traditions and family resources. At fourteen years of age the son of a craftsman or mechanic almost inevitably enters upon a trade similar to that of his father, and the problem of industrial education for the boy after this point is, consequently, a problem of supplementary education thru the continuation school.

PLACE OF MANUAL TRAINING.

In our country these conditions do not obtain. All the influences that bear upon the boy in school and out of school life tend to confuse rather than settle his ideas as to a career and to arouse a spirit of restless and disinclination for industrial work. To bring a neutralizing element into this situation and to influence boys well fitted for industrial work towards the industries, we need first of all varied, stimulating courses of manual training in the elementary schools. Not manual training that is merely busy work with tools or the making of decorated knick-knacks, but well organized constructive work that will give at each step some knowledge and experience in real industrial processes and that will have for its total result added insight into industrial methods and added interest in the doing of real industrial work.

Such a provision we would do well, it seems to me, to consider as a peculiarly American need. Altho suggestions for such work have in the past come to us from Europe and altho extensive systems of manual training exist in many of the older countries, it is apparent that the tendency toward congestion in our large cities, the almost complete lack of constructive manual experiences by the youth of these cities and the disturbing character of our social ideals as they bear upon boys and girls, make such work for us a peculiarly important and necessary foundation for an effective system of industrial education.

It is apparent, on the other hand, that the vocational school for boys and girls from fourteen to sixteen, is an institution demanded peculiarly by American conditions. The practices and prejudices obtaining in our industries shut out, to a large extent, the boys and girls below sixteen from opportunities leading to skilled or high grade positions; the character of our labor laws add to these restrictions and the terms of our educational statutes show clearly that it is more and more the tendency to hold American youth within the sphere of educational influences until sixteen years of age.

We have, because of these facts, a situation essentially American in which the social, industrial and educational elements all clearly demand further provision for industrial education for boys and girls between fourteen and sixteen years of age.

THE HIGH SCHOOL PROBLEM.

The high school, again, presents a problem in this field that is particularly our own. We have what might be called a great high school population in this country. The high school is the educational ideal of the middle class homes thruout the length and breadth of the land and sacrifices are constantly made to allow boys and girls to attend such schools comparable to the efforts made in these same homes to send boys to college.

These schools exercise a tremendously fine and steadying influence in our national life, but viewed from the standpoint of the practical world they come clearly within the field of vocational education and it would seem as if specific provisions in this direction cannot much longer be postponed. We are beginning to have high schools of commerce and by all indications we need equally high schools of industry—schools that shall be frankly recognized as vocational and that shall devote themselves to intensive technical preparation for industrial life.

Such schools should be sharply differentiated from trade schools and from intermediate industrial schools. Their students will come necessarily from homes which represent somewhat larger resources and somewhat different ideals, and their function should be to afford educational advantages that in the long run will count towards superior industrial opportunities.

CONTINUATION SCHOOLS.

In the matter of the continuation school which so far with us is almost solely an evening school we come to a more general proposition—a supplementary school for those already entered in the trades. In this field our needs and our conditions are very similar to those of the old countries.

Such schools constitute the corner stone of the German system of industrial education and are by far the largest factor in that system. They are also the largest element and the most important element in such development of such industrial education as we already have in this country. Much has already been accomplished in this direction by private foundations but in the public schools we are hardly at the beginning. The admirable work of the Springfield, Mass., Evening School of Trades presents many suggestions for the organization of such schools. Progress

in this field would seem to demand greater and greater differentiation of courses toward the needs of actual industrial workers in place of the amateurish and indefinite type that sometimes constitutes the patronage of so-called evening technical schools.

In connection with the subject of continuation schools it is perhaps a fact that our committee would have done well to emphasize the need for a special type of continuation school for boys and girls between fourteen and sixteen years of age. Such schools would not properly be evening schools but classes providing specialized instruction adapted to this age of boy and girl during the daytime, or at least before the hour of 7 P. M.

Trade schools are not included in the affirmative proposition of the report because in the judgment of the committee the need for such schools is limited to a comparatively few industries where the conditions are such as to render training in commercial practice difficult or inadequate, and to special communities representing exceptional industrial concentration. The question of general public support of such schools in the judgment of the committee is one that should be further tested and worked out by the experiments of the next few years.

These are the phases of industrial education that have seemed to your committee to represent the largest possibilities before the public schools of this country, whether considered from the side of practical results or possibilities of public support. Taken singly, your committee feels that each division represents an element of far-reaching importance, and in their entirety they submit them to you as an attempt, in the light of to-day, toward a comprehensive program of public industrial education.

NEW TOOLS REQUIRED.

METALWORK—WITH INEXPENSIVE EQUIPMENT FOR GRAMMAR AND HIGH SCHOOLS.—III.[1]

ARTHUR F. PAYNE.

BEFORE continuing with the series of graded problems, I wish to call attention to two problems that are supplementary, or similar to the book-end described in the last issue.

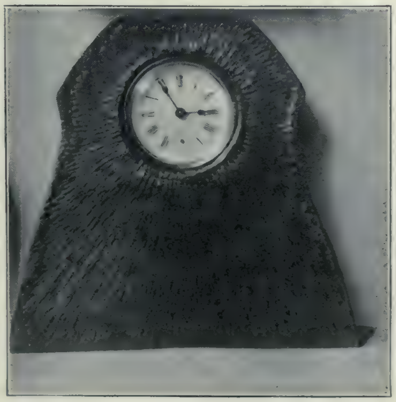
The clock is made in exactly the same manner as the book-end ; a design may be etched on the metal, and the edge is lapped over and the base is bent back in precisely the same way, the only difference being that the base of the book-end is bent back exactly at right-angles, and the clock is bent back at about 70 degrees. Any small round clock may be used ; the one in the illustration cost $1.00. The legs and handle may be taken off by unscrewing them, and it is then ready to fit to the copper holder

[1] Copyright, 1910, by Arthur F. Payne.

which is done by marking on the copper where the clock is to go, a circle that is exactly the diameter of the clock, and inside this another circle that is ½-inch less in diameter. Next, cut out the small circle as smooth as possible, either with the small chisel that was used to cut out the strap-hole on the watch-fob, or better yet, cut it out with the saw-frame described later in this article. If necessary, smooth off the edge with a file, then with the ball pien hammer on the lapping-stake turn back the extra stock to the circle that is the actual diameter of the clock as shown in the drawing, and fit the clock in tight and snug. Color and finish in any of the previously described methods.

LETTER-RACK.

The other supplementary problem is that of the letter-rack which will require a piece of 18-gage copper or brass 10 inches long by 6 inches wide. A design may be etched on the front which is 3½ inches high by 6 inches wide; the back is 4 inches high and the bottom is 2½ inches from front to back; these proportions may, of course, be varied slightly. The edges of both front and back are lapped the same as the book-ends. It is better and easier to lap the edges while the metal is flat, being careful not to make the mistake of lapping the back and front both the same way, because they will be opposite when bent up into shape, but they should be lapped as shown in the drawing. After the edges of the front and back are lapped, we may bend up the front in exactly the same manner as we did the book-end, but to bend up the back we shall need a piece of hard-wood—the end of a piece of 2 x 4 about 10 inches long would do. Bend up the back, color and finish.



CLOCK.

There are numerous other problems supplementary to this course, among them being the desk calendar made on the same principle as the clock with a narrow strip riveted on to hold the calendar, also the calen-

HINGES AND PULLS.

dar-pad holder, but enough has been said of supplementary work to show the wide variety of problems that are useful and that can be made beautiful.

When making the next of the graded problems, which is a hinge, we shall need in addition to the tools already illustrated in the preceding issues the following new tools:

No. 65,	Jeweler's saw-frame, 5 inches deep, costing..............	$.70
No. 2,	Jeweler's saw-blades, 1 dozen........................	.10
No. K,	Stake, rough cast, 15c, polished........................	.40
No. 27,	Prick or center punch..................................	.10
No. 82,	Hand-drill	1.25

Drills from 3 cents to 7 cents, according to size.

1 piece of wood, ¾ inch thick, 3 inches wide, 8 inches long, for a saw-board.

When designing the hinge it must be remembered that the first requirement is that it shall be strong enough to carry easily the door or cover for which it is made. No standard dimensions can be given for the hinge as they vary considerably in size according to the purpose for which they are made and the space they have to fill. Generally speaking there are three styles of hinges: the butt hinge, in which both ends are the same —two of these are shown in the photograph; the strap hinge, like the majority of those shown in the illustrations; the third style is called the T-hinge, one of which is shown in the drawing.

We will take for a description of process the making of a strap hinge. Hinges consist of four parts; the butt, which is the short end, the strap which is the long end, and the knuckles which fit together and are held together by the pin. There are usually five knuckles, three on the butt and two on the strap end. In other words, three knuckles on that part which is stationary when in use, and two knuckles on that part which moves. First make a full size drawing of the hinge you wish to make, then by means of the transfer paper described in the preceding issues transfer the design of the butt end to the copper or brass. Then lay out the knuckles as shown in the drawing, which is done by measuring the outside diameter and laying off three times the diameter which will, when bent around into the knuckles, be approximately the required size. Transfer and lay out the strap in the same manner.

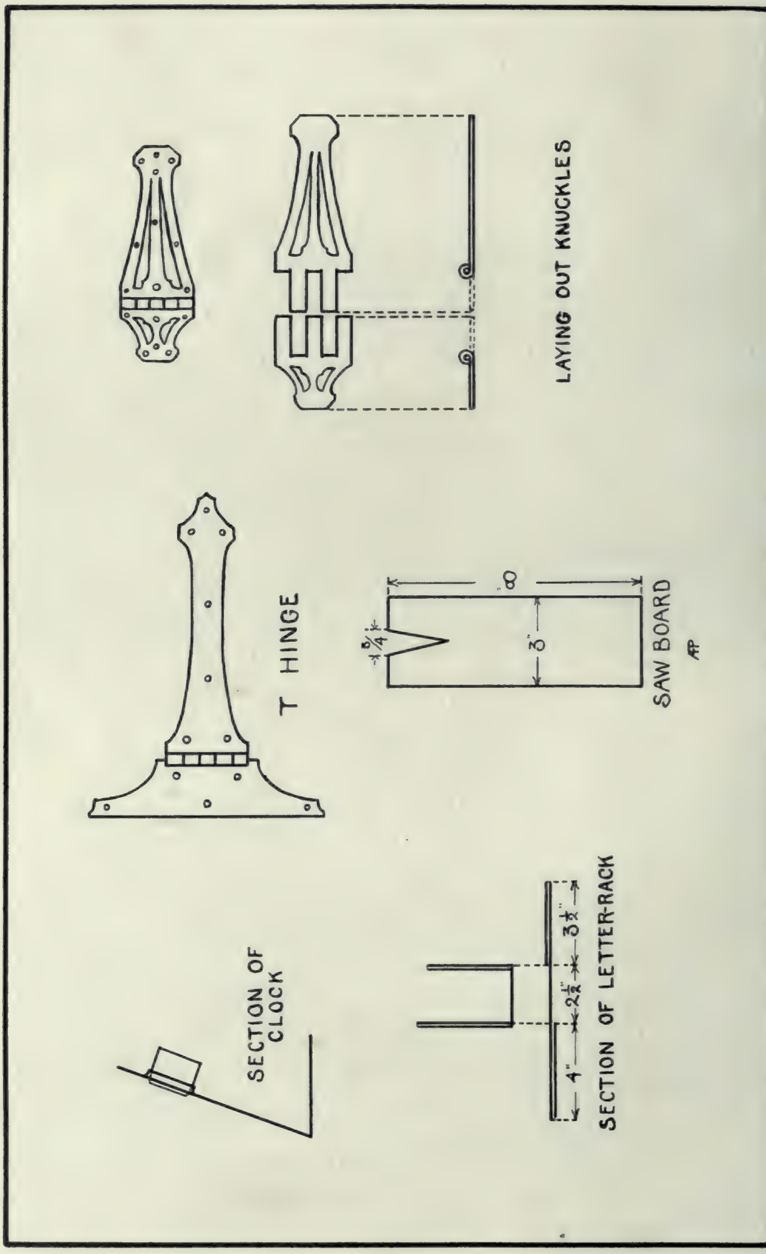
Saw out the hinge with the jeweler's saw. This process of saw piercing will require considerable care in observing a number of details, otherwise the beginner will break a number of the small fine saws. To place a saw in the frame first be very sure that the teeth point toward the handle. This can be determined by careful inspection, as the teeth

HINGES AND PULLS.

are cut similar to those of the ordinary rip-saw. Fasten the saw in the top clamp of the frame and push the top of the frame against the edge of a table or bench and the frame will give or spring just a little, then fasten the lower end of the saw in the bottom clamp. When the pressure is released, the give or spring in the frame will pull the saw tight. The saw will break in the work if it is not stretched tightly.

POSITION OF HANDS AND SAW-FRAME WHILE SAW-PIERCING.

Take a small piece of metal and practice sawing, before starting out to saw out the hinge. Fasten the saw-board to the work-bench with screws, nails, or better yet with a clamp that can be bought for 10 cents. Hold the metal flat on the board with the saw in the V-shaped opening in the board and start sawing, remembering that the cutting is all done on the down-stroke. Be sure and keep the saw-blade at right angles with the metal, and moving at the rate of about two strokes per second. When changing the direction of the saw always keep it moving up and down. This is very necessary as the saw will break if it is twisted while still. If the saw sticks and binds a little beeswax rubbed on the blade will sometimes help. To saw out the ornamental openings in the hinge it will be necessary to punch a small hole thru the metal with the prick punch; then unfasten the saw from the bottom clamp and insert the saw in the small hole in the metal, spring the frame again and fasten the saw in the clamp and proceed to saw as before. When both parts of the hinge are sawed out, bend the ends of the knuckles over on the K stake and continue bending until they are as near round as you can get them. Then get a wire


LAYING OUT KNUCKLES
T HINGE
8"
3"
SAW BOARD
SECTION OF CLOCK
4"
2½"
3½"
SECTION OF LETTER-RACK

nail that is large enough to fit the knuckles tight and hammer them smooth and round and fit the two ends of the hinge together. Push in and cut off a wire nail for the pin, to hold them together, then hammer the hinge smooth with either end of the ball pein hammer and locate the holes for the screws to fasten it to the article for which the hinge was made. With the prick punch make a small hole, and with the hand-drill drill the holes. Color and finish in any of the methods previously described.

PLACING NEW BLADE IN SAW-FRAME.

Next we have the making of the handles and pulls for drawers, book-cases, cabinets, etc., similar to those shown in the photographs. A pull or handle is made up of three parts: the back, the handle and the sockets. When designing the pull always have the lower part of the handle fall upon the back and not upon the wood. The method of transferring the design and saw piercing the back is exactly the same as with the hinge. Hammer the metal slightly to make it stiff and bend the edges down a very little so that when the pull is finished and attached to the drawer, the edge of the back will rest on the wood and not rock on the bent over part of the socket as will be shown later. Cut off a piece of wire the length of the handle, which may be found by bending a strip of tin, or fine wire, or string, around the outline of the handle on the design and then straightening it out. After the wire is cut off the correct length, bend the ends with the hammer on the edge of the lapping-tool, and bend the rest to the outline of the design. Place the handle on the back in its proper position and mark the place for the sockets which are made of a strip of metal the

same thickness as the back and about ¼-inch wide. Bend the strip around the handle; and in the back, saw out a small slit just as wide as the strip and twice the thickness of the metal so that the two ends of the strip will fit tight when they are passed thru the slit. Next bend the ends back, one up and one down and hammer them down with the hammer. If the edge of the back is not bent back slightly, as mentioned before, the ends of the sockets will cause the back to stand out from the drawer, which of course is to be avoided. Mark and drill the holes for the screws to fasten to the drawer, color and finish. Keyhole escutcheons may be sawed out and the holes drilled for the fastening screws in exactly the same manner as the hinge.

The writer of this series of articles, realizing the difficulty the average art metal worker has in obtaining the necessary tools, has taken considerable pains in choosing from the various catalogs the tools illustrated in these articles, and upon receipt of a stamped and self-addressed envelope will be glad to specify where the necessary tools and materials may be obtained.

PROBLEM IN FORGE-SHOP AND WOODWORK, PROVIDENCE, RH. I., TECHNICAL HIGH SCHOOL.

CANOE BUILDING.

EGBERT S. CARY.

TO THE average boy there are few problems more fascinating than the building of a canoe. Every normal boy is interested in boats and their use, and canoe building attracts him for several reasons. The rapidity with which the work progresses in the early stages appeals to boy nature and the promise of a seaworthy craft in spite of the slips of unskilled hands holds his interest thru the more tedious hours of finishing. His innate love of display derives no small satisfaction from the somewhat spectacular features of the work and its result.

It will not be possible within the limits of this article to cover all the details of canoe building but the conditions under which we work may be outlined, and a brief description given of our methods.

Not the least of the influences that Westtown has thrown around the succeeding generations of Quaker youths and maidens thru a life history touching three centuries, has been that of her broad acres of woodland, field and stream. Long before the present awakening to the value of nature study in our schools her pupils were marked for their knowledge and appreciation of the book of Nature.

In such environment other kindred outdoor interests have found a healthy growth, and a large part of the success of our manual training work is due to its coordination with these.

To the "Master Thomas" of Dr. Van Dyke's "Between the Lupine and the Laurel," the senior member of our faculty and an ardent disciple of nature, is due the origin and development of canoe building at Westtown. Before the introduction of manual training he and various pupils made canvas-covered boats of the old lattice-work design, and after our course was organized the canoe building went on largely independent of it. Of late years, however, the work has been systematized and has become a definite feature of our shop "hobby work," reaching its maximum both in quality and quantity last year, when twelve canoes were completed. None of these was made for sale, but the demand was such that all of them could have been sold and with few exceptions at regular market prices.

This and other forms of "hobby work," as we call the projects which the boys carry on during out-of-school hours, have no direct connection

with their class work, which is along conventional lines. It is, of course, subject to the careful supervision of the instructor and provides greater latitude for self expression than is possible in a limited course.

Under present conditions surprisingly little oversight is required on the part of the instructor. Boys who expect to build canoes watch carefully the progress of those being made, often giving hours of assistance for the privilege of "learning the trade." On the other hand, every boy who has made a canoe takes pride in directing the present builder and a wicked pleasure in subjecting his work to unmerciful criticism.

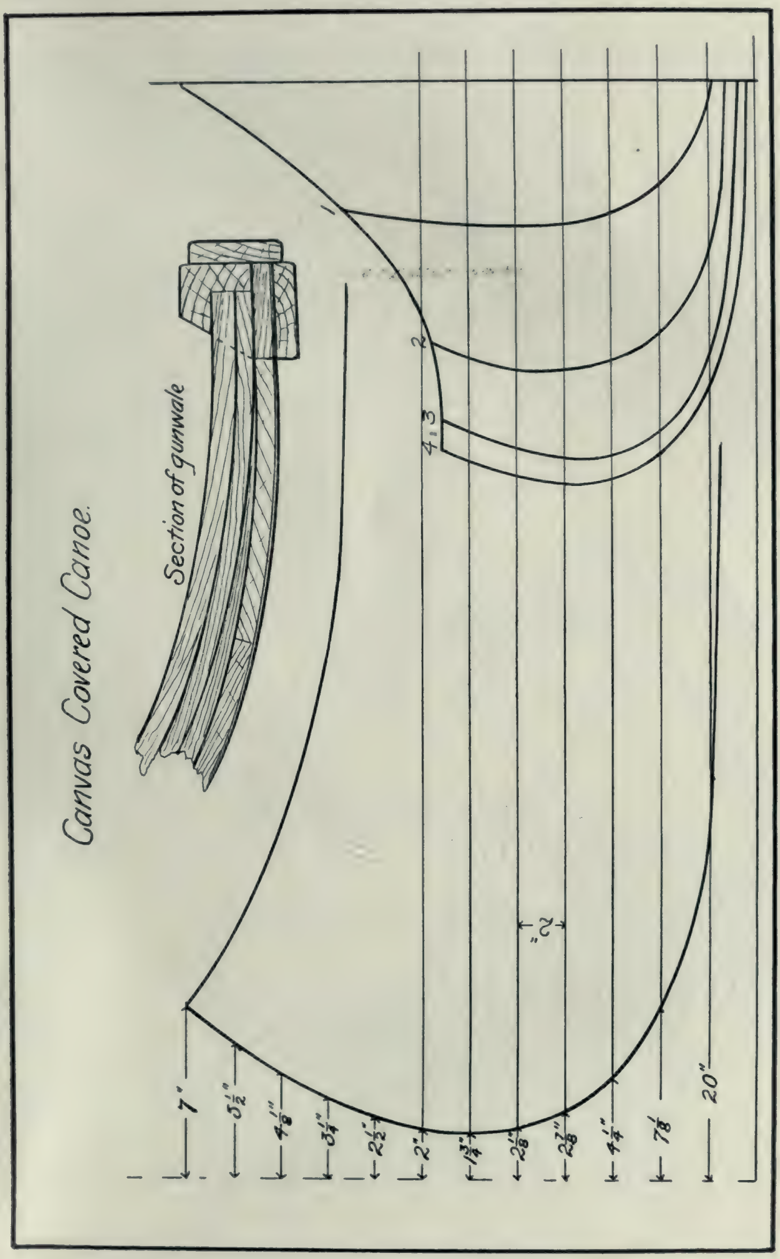
All of our boys, unless excused by doctor or nurse, are expected to take active part in the outdoor sports of the season except on inclement days when such alternatives are offered as basket ball, shopwork, swimming, gymnastics, or perhaps a rainy day walk. Out of a total attendance of 120 there are usually forty or more who elect shopwork on these days. Boys who are building canoes are excused from the above exercise requirement for a limited time and devote this and some of the shorter between-school periods to the work.

The large amount of time, between one hundred and one hundred fifty hours, necessary for building a canoe could scarcely be arranged for in any but a boarding school where the shop is an integral part of the school life and accessible at all out-of-school times.

At the beginning of each school year boys who wish to make canoes hand in their applications stating which one of our three molds they wish to use, and by note from parents or otherwise, establish their credit to the extent of $15.00, the approximate cost of the material needed. After some consultation and perhaps drawing lots, an amicable agreement is reached as to the order in which those whose applications are approved shall use the molds.

The applicants are usually older boys from the high school classes who have finished our woodworking course, although several good canoes have been made by boys who entered the school in the upper classes with no hand training. As a rule each canoe is the undertaking of a single boy who does practically all the work, calling on his friends for help at the times when two pairs of hands are needed.

Our construction is quite different from that usually seen in that we use a narrow three-ply rib instead of the thin broad rib of the common type. This makes a light and exceedingly rigid boat, but is open to the objections that better wood must be used and that a grating in the bottom is more necessary than in the usual form.


Canvas Covered Canoe.
Section of gunwale
1
2
4, 3
2"
7"
5½"
4⅛"
3¼"
2½"
2"
1¾"
2⅛"
2⅞"
4¼"
7⅞"
20"

The following specifications cover the most important features of our canoes:

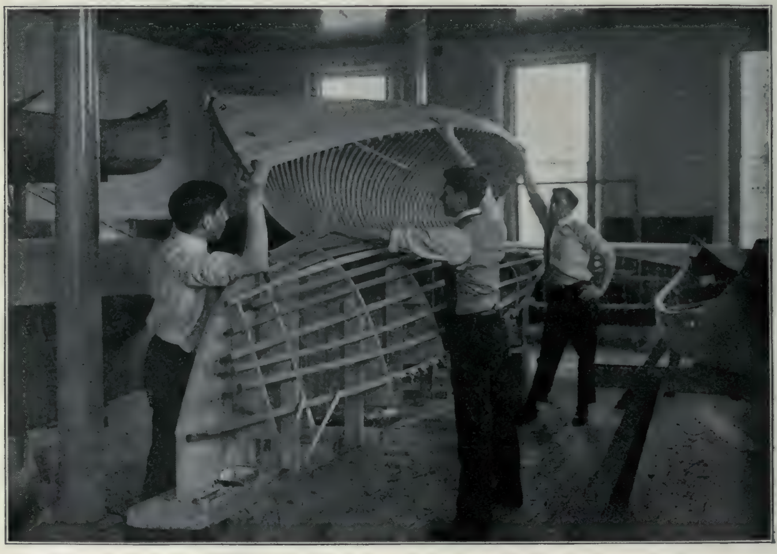
Length, 15, 15½, and 17 feet.
Beam, 31 inches.
Depth amidships, 12 inches.
Planking, 3/16 inch white cedar.
Ribs, 3-ply, 2 cedar, 3/16 inch x ½ inch; 1 elm, ¼ inch x ½ inch, half round.
Stem and stern pieces, ¾ inch x ½ inch, elm.
Nails, 1 inch, No. 15, copper.
Inwale, 1 inch x ¾ inch, spruce.
Canvas, No. 10, finished with one coat filler, two enamel, one spar composition.
Woodwork finished one coat oil, one No. 1 preservative, two spar composition.
Decks and seat frames, oak or mahogany.
Rubbing and cap strips, 1¼ inch x ¼ inch, spruce.
Bang irons, ⅜ inch, half round, brass.
Keel, flat, ½ inch x 3 inches at center, tapering to 1 inch.

We use the lines as shown in the drawing for all lengths of canoes, spacing the patterns proportionally. The following table gives the dimensions for making full-size drawings in the different sizes:

TABLE OF OFFSETS

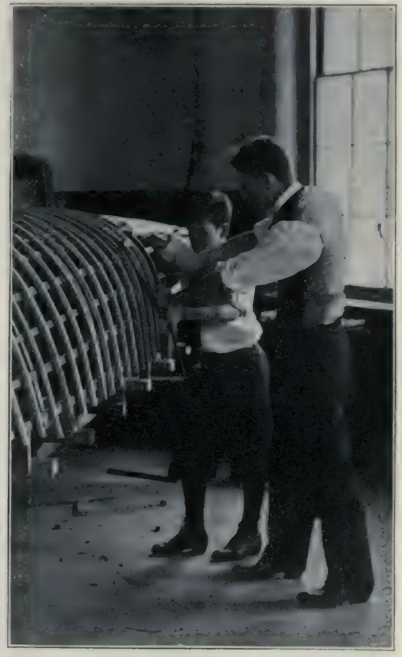
Height Above Base-line	Distance from Center Vertical Line at Pattern			
	1	2	3	4
2″	1 5/16	7 7/16	11¾	12 15/16
4″	4 5/16	10 9/16	14⅝	15 11/16
6″	5⅜	11 11/16	15⅝	16⅝
8″	5⅞	12 1/16	15 11/16	16¾
10″	5 15/16	12	15¼	16⅜
12″	5⅞	11 7/16	14⅝	15¾
Sheer	5¼	10⅞	14¼	15⅜
	Height above Base-line at Pattern			
	1	2	3	4
Keel	1 13/16	1 8/16	¾	7/16
Sheer	17¼	13½	13	13

The patterns are made by drawing the cross-section lines full size and then making a companion line inside of each at a distance depending upon



the thickness of the planking, ribs and mold battens. In our case, using $\frac{3}{4}''$ battens, this distance is $1\frac{5}{8}''$. These lines are then transferred to the boards that are to form the pattern, taking off both the curved and the vertical line, and some arbitrary point, at which a $\frac{3}{4}''$ hole is to be bored.

The patterns are mounted on a heavy plank as shown in the accompanying cuts and accurately lined by sighting thru the holes and adjusted to the vertical with a plumb-line. When fastened firmly in place the battens, which are free from knots to insure smooth curves, are nailed on. If there is difficulty in bending them to the sharper curves at the bow and stern, the battens are sawed lengthwise for a few feet at the ends. One batten is nailed on the patterns following the sheer line or top edge of the canoe and another about two inches below this. The others are spaced about six inches apart on the center pattern except at the bilge or turn where they are not more than three inches apart. At this turn the battens have their projecting corners shaped down to the contour of the mold.



The pattern of the bow and stern is made in the same manner as the above, allowing for the thickness of the stem and stern pieces and is split vertically so that the canoe can be lifted off the molds.

We buy white cedar in $1\frac{1}{4}''$ plank, resawed to $\frac{3}{16}''$, S 2 S, and crated for shipment. From these boards we cut strips $3''$ to $4''$ in width and use the waste for ribs. The elm ribs are worked at a nearby planing-mill from stock grown on our farm.

The three-ply rib as specified gives a very strong and light rib that requires only soaking before bending. The half-round elm strip on the inside takes the wear and firmly holds the clinched nails. As the ribs are bent on to the molds in planes parallel to the patterns, they are nailed to the middle and to the lower battens and at such other points as may be necessary to make them fit snugly to the mold.

The stern pieces are steamed before bending and when dry they and the ribs are shaped down so that a batten placed along the mold will bear against a flat surface at every contact. Also the outside strip of each rib is beveled down for about 4″ so that at the sheer line there are but two strips. This is done to avoid using an excessively thick inwale. Allowance is made on the pattern for this bevel which is shown in the sectional drawing of the gunwale.

The following points are observed in putting on the boards:

1. Use full length strips when possible.
2. Splice under ribs using ½ inch bevel joint. (With wide rib construction use butt joint.)
3. Do not force boards to position. Cut them to fit.
4. Remember that it is the inside that shows when done.
5. Drill holes for all nails with a drill but little smaller than the nail and space about 1 inch apart.
6. Fasten boards to the stern pieces with ⅝ inch F. H. brass screws.
7. Most important of all, as the planking proceeds remove the nails with which the ribs were fastened to the battens.

It is our practice to use an oak strip, 1¼″ x $\frac{3}{16}$″, for the last board or sheer strake, which is soaked and bent into place. This makes a strong and neat finish and gives a hard wood into which to drive the tacks for the canvas. There are no nails placed below the middle of this strip because the ends of the ribs are to be cut off at least ½″ below the top edge of the completed canoe. (See gunwale section.)

After the sheer strake is in place the ribs are sawed off below it and a little careful effort, pulling outward and upward at successive points, lifts the canoe from the mold. To prevent spreading, the gunwales are tied across in a few places and as soon as possible, the nails, beginning at the center, are clinched with light strokes turning the points along the grain of the rib.

Two extra ribs are now put in at each end where there is quite a space, the ribs for which could not easily be bent on to the mold.

The inwale, which is usually put in before stretching the canvas, is made of straight-grained spruce soaked and bent on a form. When dry it is clamped in place while the positions of the ribs are marked, after which the holes are bored and cut out "U"-shaped and the strips beveled so that water and dirt will run out freely from the completed canoe.

A cap strip of ¼″ elm is next bent around the stem and stern to give a good holding for the canvas tacks; then the outside is rasped to remove all inequalities and the boat is given a coat of raw oil.

The canoe is now ready for the canvas which is first stretched lengthwise as much as possible and kept under tension while stretching and tacking the sides. With carpenter's pincers and the edge of the canoe as a fulcrum the canvas is stretched to its limit and fastened with 1½ oz. tacks spaced ¾″ apart. Beginning in the center, a few inches on each side alternately are tacked until near the ends there develops a tendency to wrinkle. The canvas is then cut on the middle line from the end to the point where it is under tension and after coating the surfaces to be joined with white lead, it is pulled around the end and tacked. Alternately working at the end and edge completes the stretching without a wrinkle.

After many experiments we have settled upon the ordinary quartz paste as a canvas filler, altho, if properly seasoned, white lead putty does very well. The filler is mixed with oil and japan drier to a consistency that will work easily with a brush, and a heavy coat is applied to the canvas. After standing for an hour or more the excess of oil is absorbed and the filler can then be rubbed down with a leather glove to a smooth finish.

Canoe enamel can be purchased at sporting goods stores, but we make our own by straining thru cheesecloth a mixture of japan, ground color, and spar varnish.

No description of the finishing touches seems necessary except to mention that the rubbing strip is soaked and bent on the form used for the inwale, and that the keel is fastened from the inside with R. H. brass screws in copper washers, all holes through the canvas being treated with white lead.

We endeavor to have all of our boats off the molds before the spring vacation, and the few weeks after the pupils' return are busy with the finishing touches in preparation for the climax of the year's work which is marked by two events, one an all-day picnic on the Brandywine for the boys, the other, an afternoon on our own pond when the girls, escorted by the proud builders, are given a chance to test and admire the canoes.

A few years ago we made a small canvas covered motorboat which proved quite satisfactory in spite of its rather crude design. Profiting by this experience we have obtained from the board of G. F. Crouch, naval architect, plans for an 18-ft. runabout. These are well adapted to our construction, and the two boats in course of building give promise of being staunch and speedy little craft.

EDITORIAL

ON receipt of this number of the MAGAZINE the readers will notice several changes. The most important of these is in the Current Items department. Clinton S. Van Deusen, who has been in charge of this department for six years has found it necessary to give up the work owing to other duties. This we regret very much, and we are sure our readers will share with us in this feeling. Little by little Mr. Van Deusen has built up his department until it has now become the most popular in the MAGAZINE. This has required forethought, ability to gain the cooperation of a large number of people, and much discretion in selecting, editing and often rewriting the material received. What will be done in the future to supply Mr. Van Deusen's place is not yet certain, but for the present, at least, the other members of the staff will carry on the department. In this connection it should be stated that the department will be relieved of many personal items by the establishment of the new Field Notes department in the advertising section. This we hope will enable us to broaden the scope of the Current Items, thus extending still further the progressive policy adopted by Mr. Van Deusen.

Another change of considerable importance is in the character of the paper on which the MAGAZINE is printed. The new paper has been selected after testing a large number of coated papers and we believe it to be the best that can be purchased for our purpose. The reason for this change was the large increase in the number of half-tone illustrations during the past few years. It is well known that these can be printed to show their full value only on a high-grade coated paper. We hope this change will be pleasing to our readers.

Mr. Judd's Lecturers

An event of more than usual importance to American teachers of manual training was the visit of Joseph H. Judd, Superintendent of Handicraft, Manchester, England. He landed in New York on the eighth of July and sailed on the tenth of August. Most of this time was spent at Bradley Polytechnic Institute where he gave a course of seven lectures on Manual Training in England and conducted a class in light woodwork with his "Elbydee" equipment just as it is used in Manchester. The subjects of his lectures included the early history of manual training in England, training teachers, modern methods of instruction, preparatory work in the lower classes,

work in the middle grades, observations on school crafts, and the outlook for the future. Two of them were illustrated with models and lantern slides. It is certain that every one who listened to the lectures became conscious that his own manual training horizon was being enlarged, and was grateful to Mr. Judd for his frank, open treatment of each topic he presented. There was no suggestion of an attempt to prove that England had discovered the ideal system of manual training, no cant, no pretense. The whole series was an impartial and rather informal discussion of vital principles and important events by a man who spoke from experience rather than theory. He drove home his points with incidents and personal observations which were often very effective. His story of the beginnings of manual training in England and his statement of the present outlook were particularly interesting to his hearers because they contained so many facts previously unknown to them, and his discussion of fundamental principles and the practical problems of teaching and organization attracted attention because approached from a different angle—seen thru another man's eyes, and he a man working in another country under different school conditions. Mr. Judd's work surely emphasized our common experiences as teachers of manual training and will tend to strengthen the bond of interest and sympathy between the two countries.

So far as personality, spirit and adjustability are concerned Mr. Judd left nothing to be desired. No one could have fitted into American conditions more quickly and more heartily than he did. This was well illustrated on the night of his reception when in the large social hall of the gymnasium building, decorated with tree branches and the flags of the two nations, he was formally welcomed to America on behalf of the teachers of manual training and industrial education by Professor Charles F. Perry, superintendent of industrial education in the city of Milwaukee, and on behalf of Bradley Polytechnic Institute by the president of its Board of Trustees, Oliver J. Bailey. In his fitting reply and his evident enjoyment of a real American student's reception Mr. Judd won the good will of everybody. When Mr. Judd left, the *bon voyage* was most hearty; he has many friends in America.

Important Changes in England Any one at all acquainted with the internal forces at work in English manual training will recognize the great significance of two recent changes in the Board of Education inspectorate. We refer to the transfer of Sam Carrodus to London and the appointment of John Cooke as a Board of Education inspector of handicraft. Both of these appointments mean progress.

Mr. Carrodus is a native of Keighley in Yorkshire. He received his education in the Keighley Technical School, one of the earliest and best of its kind in the Kingdom. His skill in art work won for him a national scholarship at the Royal College of Art at South Kensington where he earned several gold medals. Leaving South Kensington he took the headmastership of the Ashton Under Lyne (Lancashire) School of Art and Technical Institution. It was here that the originality of his work secured the approval of the Government authorities and he was soon appointed an inspector of drawing and manual instruction in London. He was taken from this position and made inspector of handicraft for the Northwest, Midlands and the Southwest of England. This is the largest district covered by any inspector under the Education Department, reaching from the Isle of Wight to the Isle of Man. Now he returns to his previous field of labor in London as chief inspector of handicraft in the Metropolitan area. He will supervise and give advice concerning all grades of work from the infant school to the leaving age. He is a man of keen intellect and forceful personality, and with his thoro training in both art and handicraft, and his rich experience as a schoolmaster and inspector, Mr. Carrodus should be a large factor in the new and strong impulse that seems now to be setting in towards a national system of handwork for English schools.

Mr. Cooke has been assigned to the Midland Central division of England. His appointment is significant for two reasons. In the first place, this is the first time that a man has been taken from the ranks of the teachers and made an inspector. In the second place, being the secretary of the Educational Handwork Association and an ardent supporter of the fundamental principles of the Swedish sloyd, his appointment is essentially an acceptance of the principles of the sloyd, not as a finality, we believe, but as one of the important elements that is to go into the crucible out of which will come forth something better for English schools than either the Nääs system or the present London system. His appointment makes effective at headquarters a new group of forces that are primarily pedagogic rather than technical.

The day looks brighter when such men are promoted.

Dr. Kirchensteiner Coming

It has been announced that Dr. George Kirchensteiner, superintendent of schools, in Munich, will be at the meeting of the National Society for the Promotion of Industrial Education which is to be held in Boston, November 17, 18 and 19. Thru Professor Charles R. Richards, the president of the Society, we

learn that plans have been made for Dr. Kirchensteiner to visit and speak in Cincinnati, St. Louis, Chicago, and New York, as well as in Boston at the convention. It is expected that Dr. Kirchensteiner will spend four weeks in this country. His coming is a rare opportunity for American teachers. Dr. Kirchensteiner is the central figure in industrial education in Europe. His writings and his remarkable work in the city of Munich have won for him a leading place. Emperor William invited him to come to Berlin and take a higher educational position, but Dr. Kirchensteiner, being a Bavarian, preferred to remain in his home city of Munich. We should give Dr. Kirchensteiner the warmest kind of a welcome, and take heed to what he may tell us about continuation schools.

University Departments of Manual Arts The present demand for trained teachers in the manual arts, especially in high schools, is beginning to arouse the universities to action. The universities are desirous of supplying all teachers for high schools and they are finding that in order to do so in some of the newer school subjects and to meet the popular demand for the extension of practical education, they must train teachers in the manual arts. One of the first of the universities to take effective action to meet the situation was the University of Missouri when two years ago it appointed Robert W. Selvidge professor of manual training. The results already gained from this action have fully justified the step taken. Then the University of Chicago called Walter Sargent and Frank M. Leavitt to develop a new department of art and manual training in connection with its School of Education. During the past summer the University of Wisconsin has taken action which in some respects is more significant than either of the others mentioned. It has established a new department of manual arts and called to its headship Professor Fred D. Crawshaw, assistant dean of the College of Engineering of the University of Illinois. This appointment is significant because Wisconsin is one of the older and more influential of the state universities, because of the close connection of the University with the high schools of the state, and because of the freedom given to Professor Crawshaw in the development of his department. With the full cooperation of the departments of pedagogy and engineering at the University and the support of the other forces in the state interested in industrial education, the possibilities of the new department can hardly be over-estimated. The selection of Professor Crawshaw for the head of the department will be commended by all who have known of his effective work with teachers, his organizing ability and his exceptionally strong personal influence over young men.

The place made vacant at the University of Illinois by the resignation of Professor Crawshaw has been filled by the appointment of one of our editorial staff, William T. Bawden, director of manual training at the Illinois State Normal University. This is a well deserved promotion for Professor Bawden, and with full knowledge of his efficiency and personal worth, we can heartily congratulate the University.

When one man steps up another good one comes forward to take his place. Soon after Professor Bawden resigned at Normal his position was filled by the appointment of A. C. Newell, who for about fifteen years has been building up the manual training department in the public schools of Des Moines, Iowa, and during the past few years the summer school work for teachers at the Iowa State University.

College Entrance Requirements Our attention has been called to a circular issued by the High School Teachers' Association of New York City in reference to the articulation of the high school and the college. The circular opens with the statement that the forty thousand boys and girls who annually attend the nineteen high schools of New York City cannot be wisely and fully served under the present college entrance requirements. It deplores the present necessity of dividing high school students into two classes, one to prepare for college and the other to prepare for life. It points to Clark College as having perhaps the best entrance requirements; any graduate of New England public high schools or other high schools with equivalent standard being admitted. It is stated that this method has proven satisfactory to the College. But if this cannot be adopted the Association asks for (a) a reduction in the number of required subjects, and (b) the recognition of all standard subjects as electives. The circular states that the specified requirement of "two foreign languages, the meager electives in science, and the absence of recognition for drawing, music, household science and art, shopwork, commercial branches, and civics and economics constitute the chief difficulty." The Association would like to have the following credits allowed:—

"Music 1 unit; mechanical and freehand drawing, each ½ to 1 unit; joinery, pattern making, forging, machine shop practice, each ½ to 1 unit; household chemistry, botany, zoology, physiography, applied physics, and advanced chemistry, each 1 unit; modern history, 1 unit; civics and economics, each ½ to 1 unit; household science and art, 2 units; and commercial geography, commercial law, stenography and typewriting, elementary bookkeeping, advanced bookkeeping, accounting, each ½ to 1 unit."

There is every reason why this request should receive serious consideration by the Eastern colleges; it is but little more than is now granted by most of the great state universities of the West. It certainly ought to be true, and in many schools we are confident it is true, that a given number of hours spent in drawing or shopwork is fully equivalent in value either for college or for life, to the same number of hours in the study and recitation work of a course in Latin or French or mathematics. If it is not true, let the manual training teachers enrich and standardize their courses until it is true everywhere, and then we believe such a demand as the New York High School Teachers' Association is making will be irresistible. At least, it would be in the West where the universities are close to the people.

ASSOCIATIONS

The topic "Courses of Study in the Manual Arts" is engaging the serious attention of Association workers in a number of States. In addition to those instances noted in the following paragraph, several Associations have special committees at work: Ohio Art and Manual Training Association, Missouri Association of Applied Arts and Sciences, Southwestern Ohio Manual Training Round Table. The North Central Association of Colleges and Secondary Schools, at its last meeting, created a committee of five to consider plans for vocational training beginning in the sixth grade.

The fact that so many organizations are concentrating attention upon this important problem is certainly a significant sign of the times. The year just opening should see very definite progress in the direction of unification and standardization of public school work in the manual arts.

One very hopeful aspect of the situation is the evident desire on the part of the leaders in this work to avoid the "cut-and-dried" in courses of study. Outlines are planned so as to be as flexible as possible while covering the essentials and are built on a foundation of "suggestive" processes and projects rather than a fixed course of models.

It would be unfortunate for the committees in different sections of the country not to profit by the work accomplished by others interested in the same problems. The chairmen of the various committees should get into communication with each other for interchange of ideas. The Associations Department of the MAGAZINE is anxious to help in this work in any way possible, and the Editor hopes to be kept informed of events in the field.

In this connection, special attention is called to the "Directory of Organizations" on pages VII and IX of this issue. An effort will be made to make this a complete directory of Associations having to do with the manual arts in education. Information that will enable us to correct errors appearing here, and facts concerning Associations not in the list that ought to be there, will be greatly appreciated.

The Boston Manual Training Club held its first regular meeting of the year at the club camp on the Concord river, Billerica, Mass. This camp is an attractive bungalow. planned and built entirely (with the exception of fireplace and chimney) by club members. Shares in the camp are held by the members, who have the privilege of renting it for outings. The club has published a Bulletin of 28 pages which contains a roster of members, the constitution of the club, and two addresses: "What is Fundamental in Vocational Education?" by Dr. C. Hanford Henderson; and "The Essential Groundwork of Industrial Training," by Commissioner Andrew S. Draper.

The Chicago School Arts Association had a successful year with four public

meetings, October, December, February, and April. Owing to absence from the city of the officers, the annual luncheon and business meeting was postponed till October.

The Wisconsin School Arts and Home Economics Association meets in Milwaukee, November 3 to 5, 1910. Among the speakers are: Miss Isabel Bevier, University of Illinois, "The Education of the Girl;" Charles A. Bennett, Bradley Institute, Peoria, "Place of Manual Arts in Education;" Fred D. Crawshaw, University of Wisconsin, subject to be announced.

The committee of ten, which has been formulating courses of study in the manual arts for the State of Wisconsin, will present a report at this meeting. The committee has held three meetings, one at Oshkosh in February, one at Madison in April, and one at Menominee in September. In accordance with the suggestion of State Superintendent Carey, and High School Inspector Terry, the report of the committee is to be published in the next High School Manual.

The Iowa Manual Arts Association has two special committees at work. One committee, with Charles H. Bailey, State Teachers' College, Cedar Falls, as chairman, is developing a course of study for Iowa, which is to be broad in outline, suggestive and helpful to teachers, and it is hoped it may have an influence in the direction of greater unity in the work and in the matter of college entrance credits.

Another committee, with R. C. Kelley, Sioux City, chairman, is gathering a collection of tracings and formulating a plan for furnishing blue prints at cost to members of the Association. This should prove helpful in many ways and make available working drawings for a large number of supplementary projects.

The Illinois Manual Arts Association has had committees at work on courses of study for four years, and the published report which was presented at the Jacksonville meeting in February has been widely circulated in Illinois. The various courses, as outlined, are being tried out in the schools by members and others interested who, at the solicitation of the committee, have agreed to test them in their schools and present critical reports of the results at the 1911 meeting.

The Texas Manual Training Teachers' Association has been disbanded, and reorganized as the Industrial Arts Section of the Texas State Teachers' Association. The next meeting will be at Abilene, in December.

THE HIGH SCHOOL CONFERENCE.

An annual event of much interest to the high schools of Illinois is the High School Conference, which meets at the University of Illinois, Urbana, the week preceding Thanksgiving. The dates for this present year are November 17, 18 and 19.

On Thursday evening there will be the usual round-table session. Friday, all day, is given to the Section meetings, which are the most important feature of the conference. This year the following sections are expected to hold

discussions: Agriculture, Biological Sciences, Classical Languages, Commerce, Domestic Science, English, Manual Arts, Mathematics, Modern Languages, Physical Sciences, School Administration, Social Sciences. The programs for these sections will be announced later. The Manual Arts section is quite in accord with the Illinois Manual Arts Association. Several of the leading members of the Section are also members of the Association.

Work is being done, thru committees, in the way of organizing courses in manual training and in drawing.

On Friday evening Professor E. C. Elliott, University of Wisconsin, will address the general conference on "Further Needed Adjustments in the High School Program of Studies."

Saturday morning the general conference will be addressed by State Inspector Geo. B. Ailon, of Minnesota, on "The Minnesota Plan of State Aid to High Schools." This is the first of a series of presentations of different special plans for the special financial aid to high schools.

WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

The Western Drawing and Manual Training Association is unique among educational organizations in several respects. In the first place, it is generally conceded that in very few Associations is there found on the part of the members so high a degree of interest in and devotion to the affairs of the Association and consequent regularity of attendance at the meetings. Secondly, the programs from year to year contain the names of the foremost men and women in their respective lines of work, and scarcely anywhere else can opportunities for inspiration be found equal to those afforded by these annual meetings. Thirdly, the published annual reports have been growing in dignity and professional worth until now there is a large demand for them even from non-members.

In all of these, and other, respects the seventeenth annual convention at Minneapolis, May 10-13, 1910, maintained the high standards that have been set up. The accompanying illustrations are taken, by permission, from the published report of the meeting, which was issued during the summer.

Mention should be made of the splendid way in which the visiting members were entertained by Minneapolis and St. Paul. Many pleasant memories will linger of the trips to the private galleries of Mr. T. B. Walker and Mr. James J. Hill, the Minnesota State Capitol, the Handicraft Guild, the automobile rides thru the beautiful parks, and other happenings of the week..

At the opening session one of the best addresses of the week was given by Henry Turner Bailey on "How to Study Pictures." This topic was interpreted to mean "how to study pictures with children in such a way that they may come to know and choose the best in pictorial art." In "the best" we would include such works as the Sistine Madonna, and others that were named; but the question was raised and discussed, Are these "the best" with which our children are to be made familiar? The kinds of pictures suitable for study by children, with reasons, were presented, and by means of stereopticon slides the following principles were illustrated and emphasized: (1) Select for study pictures which the children can understand; (2) lead the children to

CHARCOAL AND INK DRAWINGS, FROM EXHIBIT OF CHICAGO PUBLIC SCHOOLS, MINNEAPOLIS. FROM THE 1910 REPORT OF THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

study the picture, rather than the life of the artist, the philosophy or history of the picture; (3) lead the child to appreciate the technic of pictures, that is, drawing, coloring, and composition; (4) keep in mind the future development of the children, the development of fine strong character.

One of the most valuable papers for manual training teachers was that presented by Robert W. Selvidge, University of Missouri, on "Industrial Education from the Viewpoint of Organized Labor." A few sentences follow: "It is not so much an industrial problem as a problem of humanity. From certain sources we hear much of the 'demand of industry,' but organized labor is more interested in the needs of those engaged in industry. These two views of the question are quite distinct, one looks toward a more efficient producer, and the other toward a more efficient man. . . . The proposed elementary industrial school has received some well deserved criticism from labor men; it should receive criticism still more severe from school men. There is no more reason for organizing an elementary industrial school than there is for organizing an elementary arithmetic school or reading school. Matter pertaining to the industries should have an important place in our elementary school curriculum; but it should not overshadow everything else."

Four departmental Round Tables were held for discussion of special topics: Drawing, Manual Training, Household Arts, University. The University Section has been especially active during the past year, and its Committee on the Condition of Art Work in Colleges and Universities, John S. Ankeny, Chairman, presented a valuable and comprehensive report.

The officers for 1910-1911 were elected, as follows: President, Miss Lillian S. Cushman, Univ. of Chicago; Vice-President, Charles F. Perry, Milwaukee School of Trades; Secretary, Miss Bertha L. Patt, State Teachers' College, Cedar Falls, Iowa; Treasurer, J. E. Painter, Minneapolis; Auditor, Oscar L. McMurry, Chicago Normal School. The Association voted to hold the 1911 meeting in Springfield, Illinois.

NATIONAL EDUCATION ASSOCIATION.

The forty-eighth annual convention of the National Education Association was held in Boston, July 2-8, 1910, and, while not so largely attended as some of the preceding meetings, was greatly enjoyed by those who were privileged to be present. Various organizations and committees of local teachers, business men, and citizens provided everything that could be thought of in the way of entertainment and attention to the comfort and convenience of the thousands of guests.

The magnitude of this summer educational convention is quite impressive. The printed program contained about seventy meetings in all, and in addition to the general sessions of the Association and the eighteen Sections, there were ten other societies holding meetings during the week. It is manifestly impossible for any individual to assimilate more than a small fraction of the good things offered. The most that can be undertaken in this report is to present a few disconnected thoughts gathered here and there.

One suggestion that it would be well for manual training teachers to think

PART OF THE SAINT LOUIS EXHIBIT, MINNEAPOLIS. FROM THE 1910 REPORT, WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

about is taken from the paper by Supt. W. H. Maxwell, of New York City, on "The Economic Use of Education Plants," which was read before the National Council. One paragraph is as follows:

"During the long summer vacation school premises should be used for continuation schools for pupils who have failed of promotion in June, for manual training work for children who are compelled to reside in the city during the heated term, and for playgrounds. All high schools should be maintained thruout the year, summer as well as winter. Workshops and cooking rooms should be kept in operation every afternoon and on Saturday morning for the sake of those children who cannot get sufficient eye and hand training during the regular school hours, and for children preparing for the trades. In cities in which foreign immigrants settle in large numbers, summer evening schools should be established to teach English to foreigners."

Under the chairmanship of Mrs. Ellen H. Richards, Massachusetts Institute of Technology, the first meeting of the American Home Economics Association was held on Tuesday afternoon.

"If home life is to be saved, if the old-time virtues are to be perpetuated, new forms must be found suitable for the time," said Mrs. Richards in her opening address. "For the next ten years, therefore, let us not crystallize our work or our plans into unalterable forms, but keep ever ready to take new steps —and the right solution of keeping a happy, healthy home will come at last."

Miss Helen Kinne, Teachers' College, introduced the topic of the meeting: "Presentation of Subject Matter in Household Science and Arts to Elementary Pupils." The paper, "How to Make the Household Arts Effective in the Schools and Community," read by Miss Ednah A. Rich, Santa Barbara, Cal., was of much interest, dealing with the presentation of these household problems in the most effective manner before the student. Other papers were "Practical Methods in a Household Arts Lesson," by Miss Emma S. Jacobs, director of domestic science, Washington, D. C.; "Methods of Teaching the Principles of Right Living to Little Children," by Miss Frances Stern, Louisa M. Alcott Club, Boston; "A Lesson in Cookery in the Elementary Schools," by Mrs. Alice P. Norton, School of Education, University of Chicago; "Our Penny Lunch Problem and How to Solve It," by Miss Emeline E. Torrey, Winthrop School, Boston; "How to Study House Construction," by Mrs. Ethel Fifield Brooks, lecturer on house construction at Yonkers, N. Y.; "The Teaching of Household Furnishing and Decorations," by Mrs. Mary E. Williams, director of domestic science, New York.

In the Department of Manual Training, Tuesday morning session, Edward A. Rumely, La Porte, Indiana, made a strong plea for modification of educational methods in a paper entitled, "Our Public Schools as Preparatory Schools for Life." He said in part:

"A few individual manufacturers, pressed by this need of skilled workers, have started schools of their own, only to find that often the results are lost to themselves when their employees move to other cities. A few of our larger cities have established separate trade schools, but our problem is nation-wide, and nothing but a reorganization of our whole public school system will meet it. How can we make our schools, upon which we spend more money than any

other people, fit our children for their life's work, and furnish our industries, the source of our national wealth, with their army of skilled and willing workers. . . .

"Now industry has passed forever from the home into the factory system. Sciences like physics and chemistry have become vital factors in the productive processes. Skill and accurate knowledge are needed as never before. The home can no longer give the boy and girl training for their life's work. The school must assume this function.

"Work must now become part of the school course. How shall we prepare a vast army of teachers, capable of imparting training for industrial work? How can we create the New American School?"

RELATION TO INDUSTRIAL DEMANDS.

Charles H. Keyes, Hartford, Conn., in a paper on "Better Preparation for Life Needs of Industrial Demands," said:

"Our instincts, educationally, taught us the value of motor education before we reasoned the matter out by philosophy. We have reached the time when we must stop and ask ourselves what we mean by 'pure culture.' A boy is ready for promotion when he is working at the top of his bent, no matter what the field of his endeavor. It is the power to address oneself continuously to a particular thing that brings results. What may be easy for one boy to apply himself to, may be an impossibility for another. There must come after us men and women to run our factories and industries as well as lawyers and medical men. It's the boys and girls who have been committed to our care who will be in the mills, and we must stop contending that some of our schools must not be trades schools.

"The business of the school is to fit for life's demands. To do this we must put into our schools the things which are demanded by the largest number. Bookkeeping may do for one boy what Greek and Latin could never do. It would fit him for the part he is to play in life."

Arthur D. Dean, Chief of Department of Industrial Education, Albany, N. Y., presented "A Practical System for General Training in Industrial Education," from which the following sentences are taken:

"Agitation for industrial education does not mean there is to be any educational revolution, but rather the continuance of that evolution which has been, and one hopes always will be taking place. This form of education is not antagonistic to the general function of all education which is to develop and train the mind. Some subjects and processes are best for certain groups, and every school should be the natural expression of the life of its community. It all means a redirection of our public schools and involves a comprehensive treatment of the pressing needs of our schools, our children and our industries.

"The school system may well begin to separate at the end of the sixth grade into three distinct branches, leading, first, to the present high school system; second, to higher business schools; third, to higher schools which train workers in industrial and agricultural vocations.

"A far-reaching phase will be the establishment of continuation schools.

Employers must regulate their affairs so that boys and girls between fourteen and sixteen years of age may be excused from factory and store work to attend these schools for a few hours a week in order that American citizenship may be preserved and some notion be given these immature children of industrial and commercial practice.

"At present there is little connection between school, shop and store. Children go to work because they have to become breadwinners. Meanwhile, the public schools are carried on for the benefit of those who are fortunate enough to be able to continue in their school work. By little effort the schools and factories can cooperate for training and industrial and civic efficiency."

Michael W. Murray, director of manual training in the Technical High School of Newtonville, said that much to be said about teachers for the vocational schools might apply with equal force to teachers of manual training. The manual training teacher has too much work to do, in the first place, and in the second place, the teachers are underpaid. In industrial teaching the selection of teachers is of prime importance. The higher grammar grades should be closely related to industrial life, but they are practically getting little or no manual training, and the high schools are getting manual training that educates beyond the grade of workmen. Teachers of industrial schools should be school-trained men and the broadest and best-taught workmen we can find. The ideal for teachers would be a normal schoolday course, but practically it must be given in a continuation school. They must learn so that they may teach more than one part of shopwork, they must teach the mechanical work, and they must be able to teach an academic subject. They must appreciate the need of industrial training, and we should have teachers as skilled as the most successful teachers we have in any schools.

RECOGNITION IN ENTRANCE CREDITS.

In the Department of Secondary Education much interest was aroused in the discussion of a proposition to demand of the colleges fuller recognition for work in the manual arts. Resolutions were adopted which contained reference to work done in high schools in "manual training, commercial branches, music, home-making science and art, agriculture, etc.," and the claim that these "when well taught and thoroly learned are justly entitled to recognition in college entrance credits."

In the discussion of the general topic "The Practical Aspects of Science in Secondary Education, with Special Reference to the Introduction of Materials from Agriculture, Household Arts, Technical Industries, Etc.," Louis Murbach, Detroit, said in part:

"In both nature study and elementary science the problems have been invented for the lessons. Nature problems and useful applications will be the rule in the future. The manual arts are working along this line and have made extraordinary progress in their introduction into almost all grades of the school work.

"It will be far better to articulate the new studies such as agriculture and the manual arts, in some way with the high school curriculum than to further

encourage the establishment of special schools for these subjects. The training in such schools is likely to impress their graduates with a feeling of having finished rather than having only begun to learn."

DRAWING AND THE ARTS AND CRAFTS.

In the Department of Art Education, William C. A. Hammel, State Normal College, Greensboro, N. C., read a paper on "Drawing and Its Relation to the Arts and Crafts in the Public Schools." After reviewing briefly the conditions that obtained in the public schools some years ago relative to the study of drawing, he went on to say that gradually it was recognized that drawing really had a reason for being and it then began to be correlated with other studies. Continuing, he said:

"While we have come to the point of having intellectual producers it is still rare to find the artist craftsman. We have come to recognize that there is a vital need of art in our daily life rather than a need for a $5,000 picture in some gallery. It is necessary that we train the child from the very beginning in an appreciation of the beautiful, and to understand that it is impossible to dissociate craftsmanship from design. The ideal craftsman is one who works from his own design, and the best combination in the artist is that which combines skill with clear thought. It should be made plain that nothing a child does is unrelated to his life and as he learns to make things they should be with the idea not only of usefulness, but there should ever be present the idea of the beautiful, the artistic. With the doing there should also be the thinking and the play of the creative instinct should be given wide latitude.

"In drawing is the very bone and sinew of the arts and crafts. To teach the arts and crafts without a knowledge of drawing is wrong and will result in failure and utter defeat of one's purpose. There is a great opportunity for the arts and crafts movement and it should have its most vital influence in directing the public taste, in improving the quality of manufactured articles, especially in house furnishings, thereby creating a demand for better things in the way of design. The person well educated in artistic lines can compel manufacturers to put out more artistic wares and in the simpler homes one should gradually learn to harden his heart to monstrosities too long tolerated. People can refuse longer to live in ugliness, and with this spirit given wider play its effect will soon be seen in civic conditions and it will make for greatness all around."

At the Friday morning session devoted to Manual Training and Art two strong papers were presented dealing with the problems of household arts. Miss Helen Kinne, Teachers' College, New York, in discussing "The Vocational Value of the Household Arts," said:

"If the household arts are to be truly vocational, we must insist on a thoro training for home keeping, or for work that will train the girl to earn her livelihood. The average course is too scrappy. More time should be allotted to the work, and the courses should be better organized. The matter of foods and cookery is only one element in our subject. We should also teach the girl to know the difference between fresh turkey and one that has been in

cold storage for a couple of years. We must teach her not to buy jam made out of turnip pulp, flavored with analine products, and mixed up with a little hayseed. We must go further into textile work, and teach her about sweat-shop work, and the prices which must be paid for clothing in order to insure decent conditions. Economy and the cost of living is another neglected topic."

Miss Ednah A. Rich, State Normal School, Santa Barbara, Cal., made a special plea for better prepared teachers. She said in part:

"The teacher who goes into this special work must be a woman of experience. It is not fair to put a girl of eighteen just out of high school, who knows nothing of buying and money values, in to supervise older teachers. We must make the work vital. In the elementary and grammar grades, we must make the work like home rather than like school. As a part of home making, we must take the school atmosphere away from the room, and give the children greater freedom for self-expression and an interchange of ideas."

The officers of the Department of Manual Training and Art were elected, as follows: President, Clifford B. Connelly, Carnegie Technical Schools, Pittsburg, Pa.; Vice-President, Mrs. Ellen H. Richards, Massachusetts Institute of Technology, Boston; Secretary, Miss May Gearhart, Los Angeles, Calif.

CHICAGO ACADEMY OF FINE ARTS, MINNEAPOLIS. FROM THE 1910 REPORT OF THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

SHOP PROBLEMS

George A. Seaton, Editor.

WINDOW VENTILATOR.

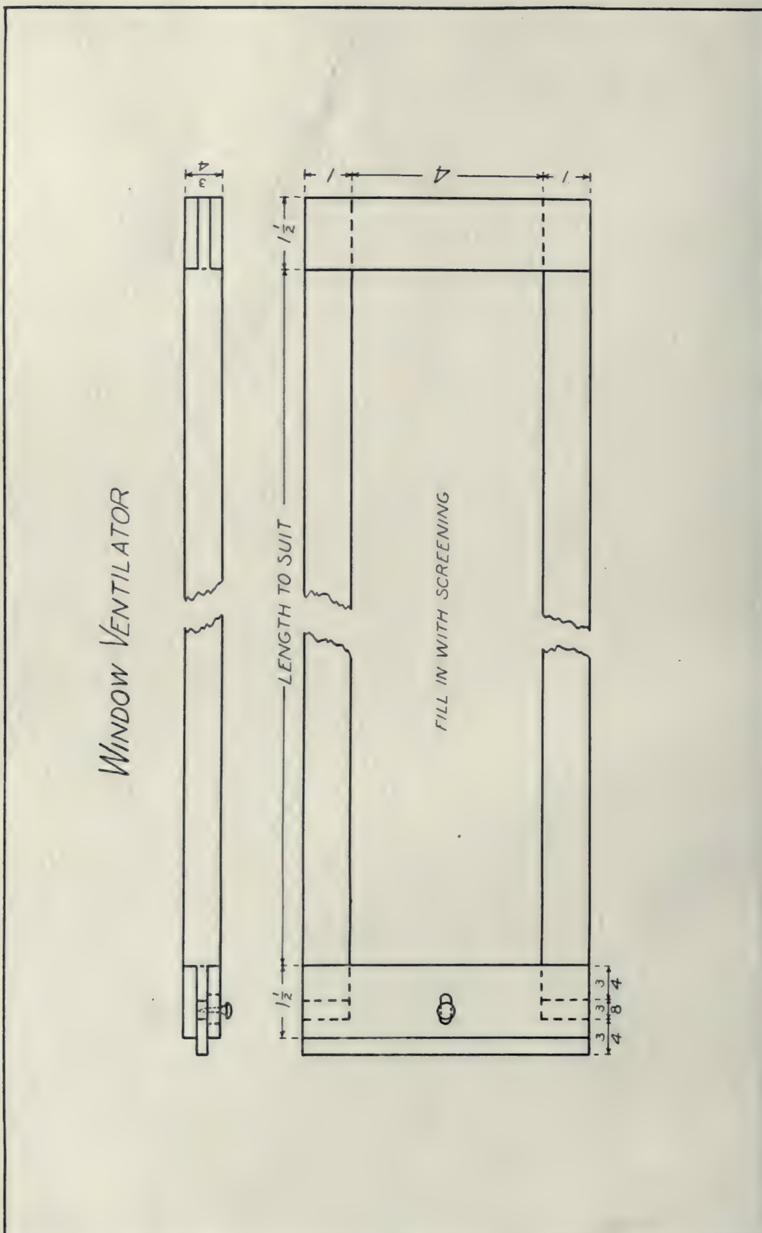
This frame is intended to be used in the winter time by covering it with cheese cloth, or in the fall and spring by using wire screening. The little strips which hold the covering material in place are not shown in the drawing. They may be placed either within the frame or on the outside. The length of the frame is such that it will just clear one stop when placed against the window frame and between the stops on the opposite side. The drawing is taken from a blueprint used by Hans Schmidt in St. Paul.

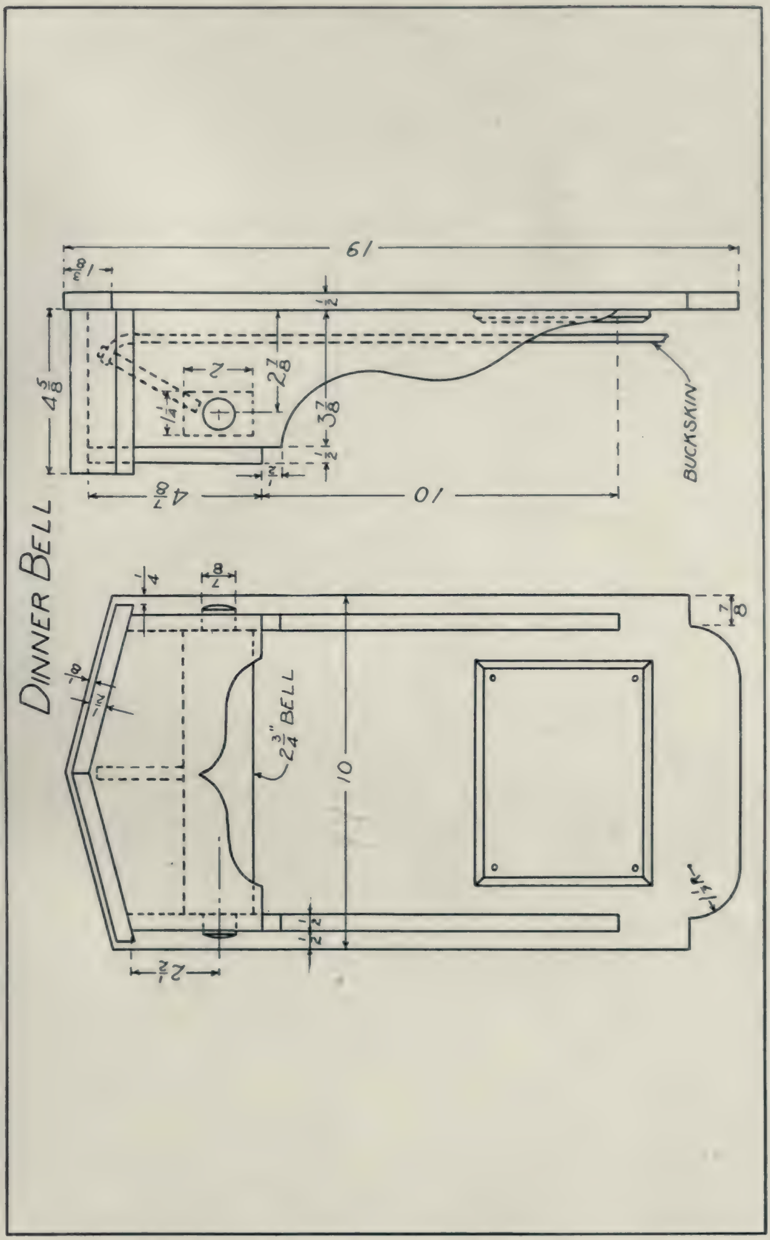
MORRIS CHAIR.

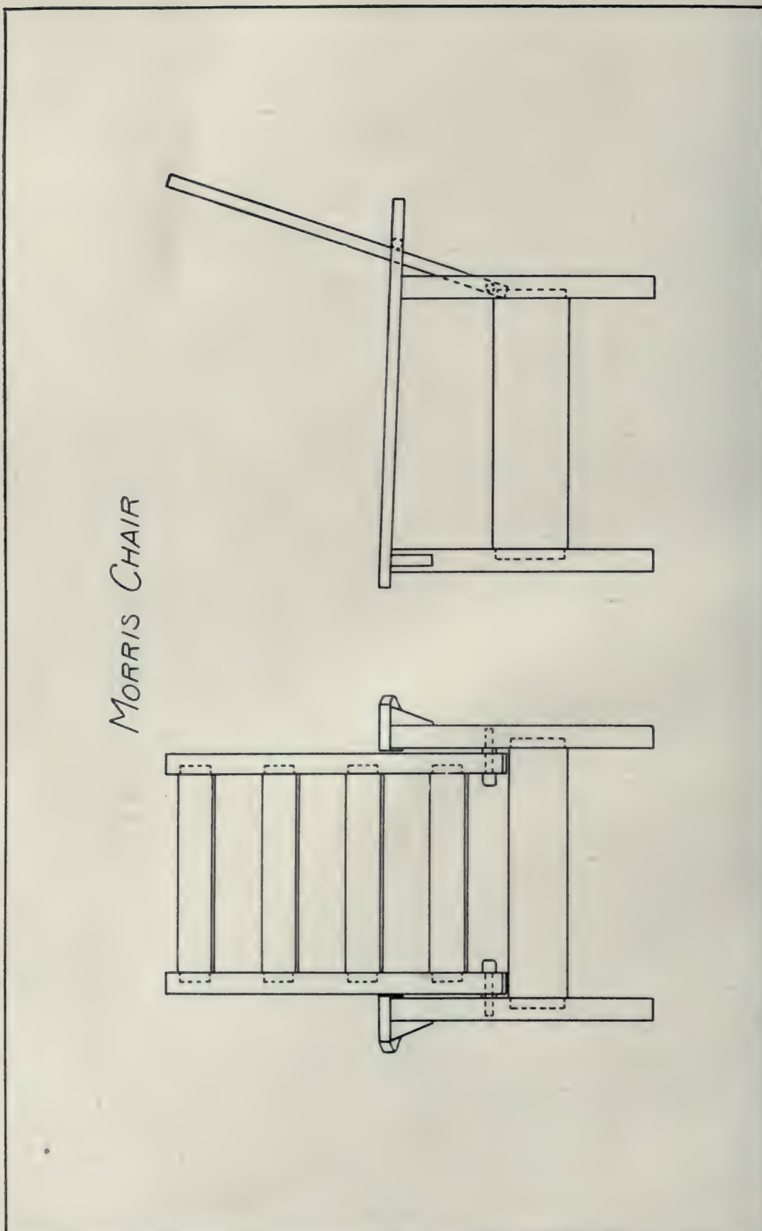
Allison P. Ball, Worcester, Mass., who sends in the working drawings for the Morris chair, says that it is very satisfactory tho composed of few pieces. As all the joints are to be glued and pinned it will be necessary to cut some twenty-four dowel-pins which are not shown in the plate of details. Eight of these dowels which are to be used in fastening the slats in the back are ⅞″ long while sixteen which are to be used in attaching the rails to the legs are 1⅝″ long. Tho the drawing is not so made, it will be possible to have a pleasing variation by extending the tenons at the top of the legs entirely thru the arms. The arms of the chair incline slightly from the horizontal, which is accomplished by making the back legs a trifle shorter than those in front. This is indicated by the two dimensions given, tho but one drawing is shown for front and back legs. The back is hinged to the back legs by means of the back pins and rests against the back stops which fit into holes in the arms. The two washers called for in the detail drawing are placed on the back pins to keep the back in proper position.

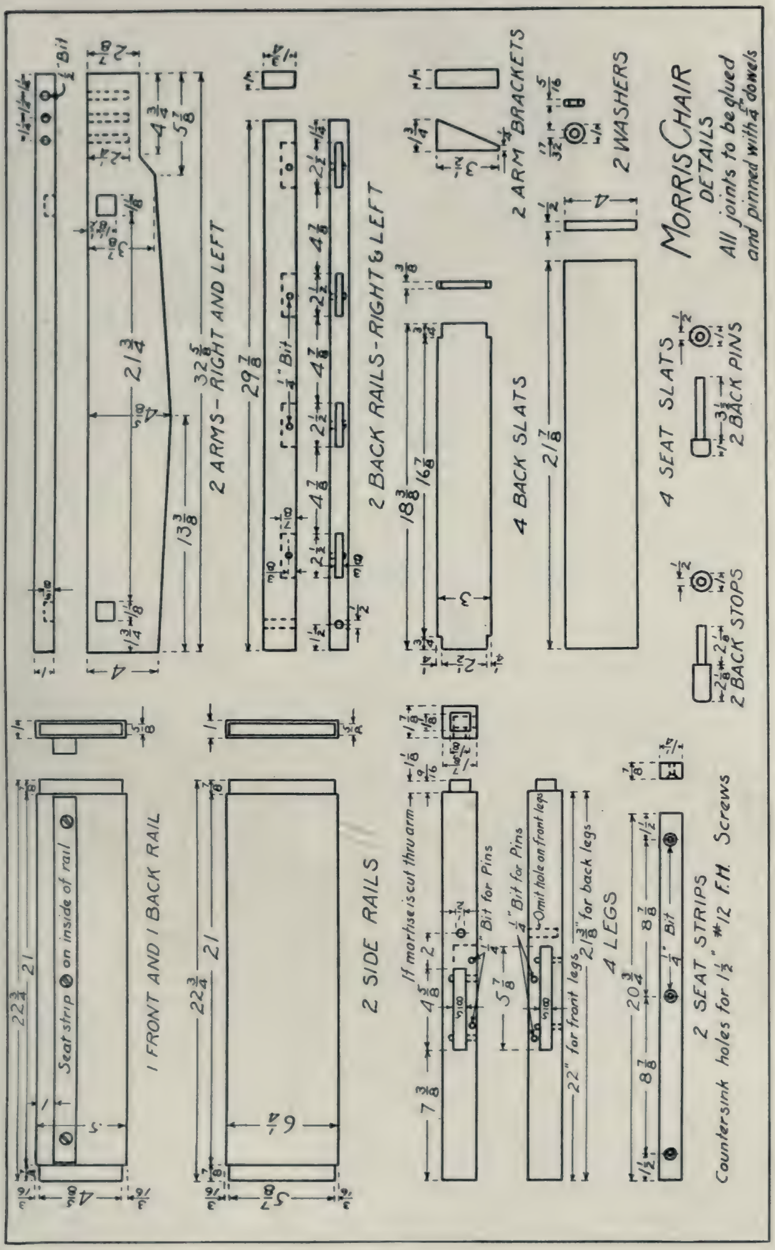
DINNER BELL.

This drawing is really that of a little house or canopy under which a bell is to be hung. When placed upon the dining room wall it not only serves its useful purpose in assembling the family for the meals but it also serves as a decoration. Dee K. Hiett, of Kane, Pennsylvania, who submitted the drawing suggests that the bell rocker be made in the lathe if possible. If such a machine is not available large dowels may be used to form the cylindrical ends of the bar, tho great care must be exercised to get these exactly in line in order that the bell may swing easily. The heavier the bell the less trouble there will be in operating it. Upon the tablet shown some appropriate motto should be carved. A suggested combination is the use of red gum for the tablet, while the balance of the bell house is finished in a Flemish oak.


WINDOW VENTILATOR
LENGTH TO SUIT
FILL IN WITH SCREENING


DINNER BELL
BUCKSKIN
2¾" BELL

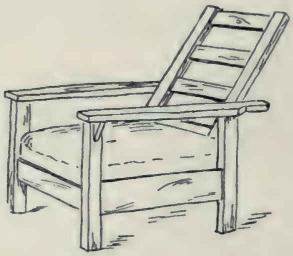

MORRIS CHAIR


MORRIS CHAIR
DETAILS
All joints to be glued and pinned with 1/4" dowels
2 ARMS - RIGHT AND LEFT
2 BACK RAILS - RIGHT & LEFT
4 BACK SLATS
2 ARM BRACKETS
2 WASHERS
4 SEAT SLATS
2 BACK PINS
2 BACK STOPS
1 FRONT AND 1 BACK RAIL
Seat strip on inside of rail
2 SIDE RAILS
If mortise is cut thru arm
1/4" Bit for Pins
Omit hole on front legs
22" for front legs
21 3/8" for back legs
4 LEGS
2 SEAT STRIPS
Countersink holes for 1 1/2" #12 F.H. Screws

SHOP COAT.

While few of us can afford the automobile, the automobile coat has proven highly satisfactory for use in the wood-turning room.. This is especially true where a pupil must hasten from the shop to a recitation. The coat can be

slipped on and off in quick time and it affords such a protection to the clothing that it is seldom neccessary to use a clothes brush. The idea is equally good for the teacher. The coats are purchased for one dollar here in Cleveland. E. H. Masters, of South High School, is the originator of the idea.



CURRENT ITEMS

Observant travelers thru some parts of New York, New Jersey and Pennsylvania this year cannot fail to notice the large number of chestnut trees that are either dead or rapidly dying on account of the spread of the chestnut canker that is threatening to exterminate this popular American tree. In the September number of the *Munsey* magazine is an article by Bailey Millard on "The Passing of the Chestnut Tree," which treats of this tree scourge from a sentimental, then scientific and finally a practical standpoint. It points out how the beautiful broad-spreading shade trees of New York state are dying in spite of the strenuous efforts of scientists to save them. Of the twenty thousand chestnut trees in Forest Park, Brooklyn, about seventeen thousand have been killed and cut down and it is expected that the remainder will be dead within a year. All efforts to save the trees by spraying or cutting off the parts supposed to be infected, are futile, as the grim disease spreads thru the inner bark as soon as the tree has once been inoculated. Not a single tree has yet been saved, tho thousands of dollars have been spent in vain efforts to discover a remedy for this insidious disease. The canker spreads rapidly from tree to tree. "Under the stimulus of the warm summer sun, the fruiting pustules of the fungus push thru the bark crevices, millions of minute spores emerge from day to day in brown masses. These are whirled away by the wind, spreading the infection far and wide to other trees of the same species." Other agencies also assist.

Besides destroying many of the largest and most highly prized shade trees in the East, baffling the scientists of the Department of Agriculture at Washington and at the New York Botanical Gardens, and taking away the sport of the small boy who goes nutting in the cool autumn days, this canker is having a very serious effect upon the lumber market. Chestnut is largely used for interior finish and for the cheaper grades of furniture. It is especially useful for fence-posts, electric light and telegraph poles, and for railroad ties, because it will remain in the ground a long time without rotting. It is stated by Mr. Millard that the lumberman's annual output is now about twenty-million dollars worth of chestnut lumber and three million dollars worth of railroad ties. The immediate effect of the canker upon the lumber business is that owners of woodlands in the neighborhood of the infected trees are harvesting their chestnut timber as rapidly as possible, tho it is not expected that this will materially reduce the price, as the lumber will be kept for future sales. It is prophesied that within the next five years chestnut lumber will be twice as expensive as oak, and that in ten years it will be as rare and costly as mahogany. This is sad news for the manual training teacher who has found chestnut less expensive and easier to work than most varieties of oak, and capable of wonderfully rich brown finish by the fuming process, especially if previously treated with a solution of tanic acid.

It is feared by some that the epidemic will spread to the chinkapin oak, which has already been known to contract the disease. If this should prove to be the case, large forest lands in the South would be affected. At the present

time the work of the chestnut canker has been confined to the territory east of central Ohio.

NORTH ATLANTIC STATES.

A movement has been started in Boston for the establishment of vocation bureaus and for the introduction into the schools of methods of guidance in the choice of occupation. The first national congress for vocational guidance will be held in Boston November 15 and 16, and will co-operate with the annual convention of the Society for the Promotion of Industrial Education, to be held in the same city November 17, 18, and 19. The purpose of the congress is to call attention to the waste of what it considers the present haphazard system of dumping young people into the world from school, and even from college, unprepared to face the problem of choosing a life-work. Emphasis is to be laid upon the unhappiness of the individual as well as upon the loss in production and the waste of human resources. The second purpose of the congress is to devise methods of meeting the problem. Consideration is to be given to such propositions as the establishment of vocation bureaus, the training of school teachers to advise children, the production of handbooks and other literature setting forth the requirements, advantages and opportunities of various occupations.

The State trade school at Bridgeport, Connecticut, opened for day students on the 15th of August and for evening students on the 22d. The number of applicants for evening work was so large that about two-thirds of them were turned away on account of lack of room. Work was offered in the machine shop department under A. L. Graffam; woodworking, under G. W. Buck; dressmaking, under Mrs. N. B. Judy; mechanical drawing, under L. R. O'Neill. The principal of the school is Alfred P. Fletcher, who comes from Rochester, New York. Mr. Fletcher is a graduate of the University of Rochester, taught three years in the Rochester Mechanics' Institute, was principal of a grammar school for three years, and since 1906 has been director of manual training and industrial education. In December, 1908, he organized the Rochester Factory School, which was the first trade school opened in New York under the recent Act providing for trade schools. Six months later an elementary industrial school was organized to prepare boys for this trade school, and during the past few months Mr. Fletcher has been engaged in organizing a girls' trade school. In characterizing a trade school recently, Mr. Fletcher said: "The trade school is a typical little factory, with the emphasis on the boy and not on the product." It seems evident that Mr. Fletcher will live up to this definition in his new position.

Another trade school is being established in Connecticut under the State Board of Education. This one is at New Britain and is under the direction of Clarence H. Woolsey, formerly of Middletown. Instruction will be given in machine-work, tool-making, die-sinking, pattern-making, and carpentry. Mechanical drawing, shop arithmetic, English, business methods of the trade, and the sources and preparation of material will be included.

A school experiment is being carried on by the H. H. Franklin Manufacturing Company of Syracuse, New York. This company has established what it designates as a technical class for which it provides a four years' course of instruction. During the entire four years students are employed at a definitely pre-determined wage, graduated from 8c an hour at the start to 20c an hour at the end, with a bonus of $100 at the time of the award of the school diploma for the completion of the course. Students will be given instruction in arithmetic, plane geometry, trigonometry, elements of machine design, shop mathematics, mechanical drawing, analysis of machines, in addition to their instruciton in the shop. To be eligible for entrance to the technical class an applicant must be between sixteen and twenty years and must have had a grammar school education or its equivalent. He must also be physically sound and of good character and appearance. During the first twelve weeks he will be on probation, that time being designated as a term of trial. Each year the course consists of twenty-seven hundred working hours.

The manual training and domestic science departments of the Braddock, Pennsylvania, public schools were discontinued about four years ago by the school board in its endeavor to cut down expenses. This year both of these departments are being resumed, the manual training to be in charge of Mr. F. C. Steltz, of State College, Pennsylvania.

SOUTH ATLANTIC STATES.

In Athens, Georgia, they are seeking to rear a monument to the Old Black Mammy. This will not be a shaft of stone, but an industrial school for the training of negro girls. Five acres of land have been secured in the eastern section of Clark County, and more has been promised. Money is being raised to further the project and it looks as tho the white people of the neighborhood will put the school on a good working basis. The *Atlanta Constitution* says of it: What is to be the destiny of this particular school we do not know. But every white Southerner knows that if it is conducted with the sound sense, if it inculcates the unswerving fidelity of the type of negress for which it is named, it should prove a benefaction to its environment. Do we not need more of these Old Black Mammy schools in the Southern states? The very spirit of the phrase spells the life-blood of that solution of the racial problem the *Constitution* has been urging upon the churches and the whites and the blacks of the Southern states."

The Georgia Legislature has passed a bill which has been recently signed by the Governor appropriating $35,000 for the Georgia School of Technology on condition that $15,000 will be raised by private subscriptions. The purpose of this fund of $50,000 is to construct a new shop building, thus making room for several hundred more students in the school.

A commission on industrial education appointed by Governor Crothers of Maryland has recently made its report. This presents a strong plea for

industrial education in all public schools, both urban and rural. They insist that the success of maintaining industrial education depends upon state funds. Cities and counties should be encouraged by liberal state support because industrial schools will be a factor in advancing the industries of the whole state. From this it follows that the control of the industrial education should be in the hands of the State Board of Education who would work thru County Boards, strengthened, if need be, by the addition of advisory committees of citizens. The report points out that in industrial education for the rural schools there must be a very close cooperation with the home. It also adds that before entering upon industrial training pupils should have had some form of handwork in the elementary schools, and they estimate that the amount should be one hour a day. Industrial training should begin after the ordinary school work is fairly completed. Under ordinary conditions the vocational schools should be open to pupils who are thirteen or fourteen years of age.

The address of President Joyner of the National Education Association in Boston last summer has received considerable attention from the press of the country. A Boston paper says:

"It is President Joyner who utters most earnest warning against going to extremes in industrial education. He sees the danger that the 'apostles of this new light, blinded by its first dazzling burst of light, may lose their educational perspective and forget that education has any other end but the vocational.' He urges with force that in swinging from one extreme that produced men with an education, we must not swing to the other extreme that will produce men with a vocation without an education."

Manual training in the city of Washington, D. C., has not been forgotten in the recent appropriation bill. The sum of $22,000 was provided for furnishing an extension to the McKinley Manual Training School; $42,000 for a new manual training school to replace the old High Street school; $65,000 for an addition to the Armstrong Manual Training School, and $40,000 for a manual training school to be placed on the grounds of the Cardozo school.

CANADA.

Canada has a Technical Education Commission which began its work July 6. This Commission was appointed at the request of the prime ministers of all the provinces. It is hoped that its work will lead to a sound national policy with reference to industrial and technical training, based upon the abilities and opportunities of the Canadian people. The members of the commission are: Dr. J. W. Robertson, of Montreal, chairman; Hon. John N. Armstrong, North Sydney; Dr. George Bryce, Winnepeg; Mr. Gaspard DeSerres, Montreal; David Forsyth, Berlin; Gilbert M. Murray, Toronto; James Simpson, Toronto; and Thomas Bengough, secretary.

Professor Robertson is widely known on account of his work as the first commissioner of dairying and agriculture for Canada, for his connection with the Macdonald Sloyd School Fund, and later as the organizer of Macdonald

College. Hon. John N. Armstrong is a barrister, a graduate of Harvard University and a member of the Legislative Council of Nova Scotia. Dr. George Bryce is one of the founders of the University of Manitoba and was for a number of years the head of its faculty of science. He is president of the Royal Society of Canada, a noted scientist, and author of works in history, forestry, botany and agriculture. Gaspard DeSerres is the president of the Montreal Technical Schools and a director in many philanthropic organizations and industrial and commercial firms. Gilbert M. Murray is the editor of *Industrial Canada,* the organ of the Canadian Manufacturers' Association. David Forsyth is president of the Berlin Commercial and Technical Institute. James Simpson is the representative of the Dominion Trades and Labor Congress. Thomas Bengough is president of the Canadian Shorthand Reporters' Association of Ontario.

Beginning with the maritime provinces and working westward, the commission aims to make a personal inspection of the leading establishments of the Dominion, to interview employers and men, and hear representatives of boards of trade, factory inspectors, trade unions and employer's associations. After touring Canada and the United States, it plans to go to Europe, spending, in all, a full year in its work. The initial meeting of the commission was held at Ottawa with the Minister of Labor, immediately after which it went to Halifax, N. S.

The Chess Board shown above is the work of a seventh grade Icelandic boy sixteen years of age in Winnepeg. Before making the board the boy made a drawing and blue-print of it. The design for the carving was adapted to the size of the frame from a design given him for a frame two inches larger.

NORTH CENTRAL STATES.

The retirement of Principal C. E. Emmerich at the close of the last school year marked the end of what may appropriately be called the first chapter in the history of the Indianapolis Manual Training High School. Mr. Emmerich

can truly be called the father of this great school. It was under him as principal that the building for the school was constructed and a course of study outlined some seventeen or eighteen years ago. This early work of Mr. Emmerich was done so well that the school became popular at once and has since become well known thruout this country, and even in foreign lands. It was with some difficulty that the exact nature of the school was determined, but Mr. Emmerich saw that the work done in the school must be practical, and at the same time include the fundamentals of a good general high school training.

As the school was somewhat of an experiment, the outcome being uncertain, the building was designed to accommodate only 600 pupils. To the surprise of all connected with the school, when it first opened its doors in February, 1895, the enrollment was 526, including both boys and girls. Under the wise and careful management of Mr. Emmerich the enrollment has steadily grown until last year it almost reached 2,000.

Having given forty-one years of continuous service to educating the young, nearly all of which time was spent in Indianapolis, though born and educated in Coblenz, Germany, and feeling his health breaking, Mr. Emmerich considered it his duty to retire and lead a less active life. His work has produced a lasting effect upon the lives of the many pupils and teachers who have been connected with the school, and upon the kind of education for which it stands.

Milo H. Stuart, the assistant principal, has succeeded Mr. Emmerich to the principalship. Two years ago he was principal of the Cleveland High School in St. Paul, Minn., and from there came to Indianapolis last year.

The Illinois Educational Commission has appointed a committee to make a thoro study of agriculture, manual training and domestic science, as subjects of instruction in the common schools. This committee is to cover the ground of the aims and purposes of these subjects, the matter and method for course of study in them, as well as the preparation of teachers for teaching them.

This committee consists of Dean Eugene Davenport, chairman, University of Illinois; President David Felmley, Illinois State Normal University; Dr. T. C. Burgess, director Bradley Polytechnic Institute; Miss Bertha M. Miller, head of the Domestic Science Department, James Millikin University; Mrs. Henry M. Dunlap, president Domestic Science Department, Illinois Farmers' Institute; Dr. Frank H. Hall, Superintendent Illinois Farmers' Institute.

This committee will make its report to the Educational Commission not later than November 1st.

A special committee of the Legislature of the State of Wisconsin has been appointed to draft a bill for continuation schools. This committee is considering the advisability of compulsory education in trade or continuation schools for children who have passed the age of compulsory education in common schools, and are not voluntarily attending any other trade or domestic science schools. No doubt this action has been inspired by the success of compulsory continuation schools in Germany.

Manual training schools for children at summer resorts are quite in harmony with the spirit of the times. They spring from the same source as the vacation schools for children in large cities. Such schools as the one at Chautauqua, N. Y., and Bay View, Mich., are a boon to many a child. At Bay View during the past summer Miss Anna S. Lagergren aroused much enthusiasm among her pupils by teaching them how to make doll furniture.

Thru W. S. Hiser we learn that Richmond, Indiana, is completing a $200,000 high school which will provide four rooms for manual training, one for bench-work in wood, wood-turning and pattern-making, forging and machine shop work.

In a recent editorial the *Cleveland Leader* pays a high tribute to manual training as a means of giving boys the right ideas with reference to work. After speaking of the tendency that was especially strong a generation ago for boys to gravitate to occupations in which they could "dress like a gentleman," the article states that the day of this sort of nonsense has practically passed away.

"The present industrial age has placed the crafts side by side with the professions. The colleges, every year, are graduating professional men who immediately don overalls and jumpers and proceed to work with their hands in mines, factories and iron mills. The manual training embodied in the modern system of public education has imbued thousands of boys with the ambition to produce something of value out of raw materials."

It is reported that a trade school established last year in the public school system of Saginaw, Michigan, has shown substantial progress and that other cities in the state are watching the experiment with great interest.

WESTERN STATES.

In a recent lecture before the State Normal School at Greeley, Colorado, Dr. G. Stanley Hall made some striking statements concerning industrial education. In his characteristic way he said that sloyd is the most sophisticated of all types of industrial education. It is purely mechanical. A manual dexterity without being wedded to enthusiasm is of no use. Dr. Hall predicted that within the next ten years we shall see the greatest revolution in the history of education, and that we shall see industrial education given its true value.

Inspired by the example of Paulham and Curtiss at the aviation meet, the boys of the Los Angeles public schools, in their annual kite tournament this year, produced scores of biplanes, multiplanes, and other aircraft in miniature. But Los Angeles is no longer the only city in which a kite tournament is held. It was part of the program of the vacation school work in Springfield, Mass., and was inaugurated in one form or another in several other cities.

REVIEWS

Modern Cabinet Work, Furniture, and Fitments. By Percy A. Wells and John Hooper. B. T. Batsford, London, and John Lane Company, New York, 1910; 10½ x 7 in.; 384 pages, and 48 double-page and photographic plates. Text richly illustrated with more than 1,000 line drawings and photographs. Price, $5.00 net; postage, 50 cents.

This is a most satisfying book. From the standpoints of scope, selection of material, style of writing, arrangement, type, presswork, quality and number of illustrations, wealth of suggestions for designers, and practical help to workmen in the shop, this book leaves little or nothing to be desired. One feels that he has a half-dozen excellent books in one unified production.

The book is written by men of high standing. Mr. Wells is at the head of the cabinet department of the Shoreditch Technical Institute and advisory instructor at the Central School of Arts and Crafts in London. He is also silver medalist of the Royal Society of Arts. Mr. Hooper is an honors silver medalist of the City and Guilds of London Institute.

After the introductory chapter dealing with the craft of cabinet-making, the book devotes a chapter to tools, appliances and materials. Following this is one on drawing, geometry, design and technical terms, and another on joints and their applications. The fifth chapter deals with workshop practice and construction, including "carcase" construction, door-making, drawer work, and curved work, besides the more elementary processes of woodworking. Chapters six, seven, and eight, covering 122 pages and dealing respectively with tables and framed-up work, "carcase" work, bedsteads and miscellaneous furniture, contain a wealth of practical help for both designer and workman, much of which we have never found in any other publication. Chapter nine is devoted to veneers and veneering, marquetry and inlaying, and especially gives practical instruction on these subjects. Foreman's work—practical setting out and applied geometry, is the subject of the tenth chapter; this includes some of the cabinet-maker's most difficult problems. Then follow notes on the historic styles of furniture, with examples of modern work; a chapter on hardware; one on machine tools, machinery and mouldings; one on interior finish for buildings; one on special furniture for shops, offices, and museums; and one on chair making. The last chapter is on woods, English and foreign. At the end of the book is a glossary of technical and workship terms, and a short list of books on historic furniture.

If one is looking for the best and most comprehensive book on cabinet-making, there is no other book to buy; it is the only one of its kind. It is a rare book of reference. We recommend it to libraries in technical, manual training and industrial schools where any advanced work in furniture construction or design is undertaken, and to public libraries interested in purchasing books that will help in raising the American standard of art and craftsmanship.

—C. A. B.

The Potter's Craft. By Charles F. Binns, Director of the New York State School of Clay Working and Ceramics. D. Van Nostrand Co., New York, 1910; 5½ x 8 in., 171 pages, 21 plates and 20 diagrams; price, $2.00 net.

It is not too much to say that the standing of Professor Binns is so high among the teachers of pottery that any book on pottery written by him would be looked upon as authoritative in its statements. In this work Professor Binns has set forth in simple, explicit language the method of making and finishing pottery as he teaches it to his pupils. The book is the result of many years of experience as an artist-potter and teacher in this country and at the Royal Porcelain Works in Worcester, England. The earlier chapters are on the preparation of clay, mold-making, building by hand; then follow chapters on turning, casting, tiles, glazes and glazing, decoration, and firing. The last chapter discusses clay-working for children.

A Primer of Architectural Drawing. By William S. B. Dana. The William T. Comstock Company, New York, 1910; 5 x 7½ in.; pp. 153; price, $.25.

This is a course of twenty-five problems by an instructor in the Mechanics' Institute, New York City. It begins with the drawing of brickwork—mere horizontal and vertical lines—includes the drawing of plans, elevations, details,—and ends with the study of a fireplace. The text is written in simple style, as one would talk in a classroom. Unfortunately the drawings are not all up to the desired standard and some of them are reduced too much to be satisfactory.

The Apollo Collection of Songs for Male Voices. By Frederick E. Chapman and Charles E. Whiting. Ginn & Company, Boston, 1910; 9 x 6½ in.; 264 pages, price, $1.00.

This collection of songs has been prepared especially for boys, and is intended for use in preparatory schools, colleges, and glee clubs. Careful attention is paid to the range of each voice and directions for the classification of voices are given in the foreword.

The Art of Curative Gymnastics. By Tell Berggren. The Good Health Publishing Company, Battle Creek, Mich., 1910; 10 x 7 in.; 119 pages, illustrated with many half-tone engravings; price, $1.00.

This book is written by the teacher of Swedish gymnastics at the Normal School of Physical Education, Battle Creek, Mich.

What to Do at Recess. By George E. Johnson, superintendent of playgrounds, park and vacation schools, Pittsburgh, Pa.; Ginn & Co., Boston, Mass., 1910; 7 x 4½ in.; pp. 33, including many illustrations; price, 25c.

This book is intended to show the teacher how to make the playground a physical, mental and moral tonic for the children.

Wentworth's Plane Geometry. Revised by George Wentworth and David Eugene Smith. Published by Ginn & Company, Boston, 1910; 7½ x 5 in.; pp. 287; price, 80c.

This book is an effort not only to preserve but to improve upon the simplicity of treatment, clearness of expression, and the symmetry of page that have characterized previous editions of the Wentworth's Geometry.

RESERVED FOR LATER NOTICE.

School Drawing—A Real Correlation. By Fred H. Daniels, director of drawing, public schools, Newton, Massachusetts. Published by Milton Bradley Company, Springfield, Mass.

Nature Drawing from Various Points of View. Edited by Henry Turner Bailey, editor of The School Arts Book. Published by the Davis Press, Worcester, Mass. Price, $1.50.

Modern Lettering, Artistic and Practical. By William Heyny. Published by William T. Comstock, New York. Price, $2.00.

The Educational Meaning of Manual Arts and Industries. By Robert Keable Row. Published by Row, Peterson & Company, Chicago. Price, $1.25.

Simple Jewelry. By R. L. B. Rathbone. Published by D. Van Nostrand Company, New York. Price, $2.00.

Vocational Education. By John M. Gillette, professor of sociology in the State University of North Dakota. American Book Company, New York.

Shop Mathematics. By Edward E. Holton, head of department of machine shop practice in the Technical High School, Springfield, Mass. Published by The Taylor-Holden Company, Springfield, Mass.

Shop Problems in Mathematics. By William E. Breckenridge, chairman of the department of mathematics, Samuel E. Mersereau, chairman of the department of woodworking, and Charles F. Moore, chairman of the department of metalworking, in Stuyvesant High School, New York City. Published by Ginn & Company, Boston. Price, $1.00.

Woodwork for the Grades. Parts I, II, III and IV. Published by Orr & Lockett Hardware Company, Chicago.

RECEIVED.

The Logic and Method of Industrial Education. By Dr. Calvin M. Woodward, St. Louis, Missouri. Reprint of the president's annual address, from the proceedings of the North Central Association of Colleges and Secondary Schools.

Indo-Malayan Woods. By Fred W. Foxworthy. The Philippine journal of science, October, 1909. Published by the Bureau of Science of the government of the Philippine Islands, Manila, P. I. This is a monograph of 182 pages and nine full-page plates of half-tones showing sections of different kinds of wood. It covers the properties of the several woods of the East, the suitability of these woods for special purposes, the timber area and future supply, and gives many other important facts, both scientific and practical, concerning the woods of the Orient. In this monograph one finds a description of many of the rare woods seen in this country chiefly in museums. Such an authoritative publication would be of value in many school libraries where attention is given to the study of woods.

The Place of Industries in Public Education. Report of a Committee of the National Council of Education, Jesse D. Burks, chairman, presented in Boston, July, 1910. An extensive report covering many phases of the problem. This report can be obtained from the secretary of the National Education Association, Dr. Irwin Shepard, Winona, Minnesota, for 15 cents a copy.

Addresses and Papers. By Andrew S. Draper, Commissioner of Education for New York State. Published by the New York State Education Department, Albany. This volume of 178 pages contains one chapter on "The Essentials Groundwork of Industrial Education," an address given before the Massachusetts State Teachers' Association, November, 1909.

A Descriptive List of Trade and Industrial Schools in the United States. Bulletin No. 11, published by the National Society for the Promotion of Industrial Education, Edward H. Reisner, Secretary, 20 West Forty-fourth Street, New York City. Contains 128 pages of data well selected and conveniently arranged.

The Factory School of Rochester. By George M. Forbes. *The National Importance of Industrial Education.*. By Rush Rhees. Two addresses before the second annual convention of the New York State Branch of the National Society for the Promotion of Industrial Education. Issued in pamphlet form by the Branch, Arthur L. Williston, Secretary, Pratt Institute.

The One-Room Country Schools of Illinois. By Francis G. Blair, State Superintendent of Public Instruction. This is a well-illustrated pamphlet of ninety-two pages giving plans and specifications, data concerning heating systems, etc. It deals with buildings costing from $800 to $1,650. The pamphlet is full of information intended to help in a forward movement in the country schools of the state.

Vocational Training. By T. S. Inborden, principal of Joseph K. Brick School, Enfield, North Carolina.

A booklet of forty-seven pages.

The Society of Arts and Crafts. Thirteenth annual report of the Society of Arts and Crafts, Boston, Mass. Frederick A. Whiting, Secretary, 9 Park Street, Boston.

Year Book, 1910. The annual publication by the students of the Lane Technical High School, Chicago, Illinois. A creditable publication giving an unusually large amount of space to the plans and equipment of the building and to the work done in the classes. The whole publication suggests that the spirit of this school is earnest work and good fellowship.

Mission Furniture. How to Make It. Part 2. Published by Popular Mechanics Co., Chicago, Ill. This is the second volume on this subject, and No. 3 in the 25c handbook series. It tells how to make thirty-two pieces of furniture; it gives working drawings, stock lists, and half-tone illustrations of the completed pieces. In some cases details of construction are shown in separate drawings, as for example, the method of making screws hold in the end grain of wood, the method of cutting tenons with a handsaw and an easy way of making dowels. Most of the designs are very satisfactory.

City and Guilds of London Institute. Program for the season 1910-11; containing regulations for the registration, conduct, and inspection of classes, and syllabi of technological subjects in which examinations are given. This is a paper-covered book of 352 pages and is sold by John Murray, Albermarle Street, London. Price, ninepence net. It includes courses for teachers of manual training.

Nineteenth Annual Report of Board of Education, Salt Lake City, Utah. This contains the reports of the Art Department, the Manual Training Department, the Sewing Department, and the Vocational School.

Manual Training Studies. By George Fred Buxton. Published by Stout Institute. This is an outline of topics covered in the course in organization, teaching, and supervision of manual training at Stout Institute.

Manual Training. Advance sheets of syllabus for secondary schools, 1910. New York State Education Department, Albany. Covers the subjects of joinery, wood-turning, and pattern-making, and gives lists of equipment and books on each subject.

Courses in Manual Training, Domestic Science and Domestic Art. Detroit Public Schools. This covers cardboard construction, mechanical drawing, bench-work in wood, domestic art, domestic science, joinery, wood-turning, pattern-making and machine-shop practice. The work in cardboard construction is given in great detail and each problem illustrated with a working diagram. The same is true of the woodworking for the grammar grades.

Independent Industrial Schools. A reprint from the annual report of the Massachusetts State Board of Education. David S. Snedden, Commissioner, Ford Building, Boston, Mass.

Drawing. Advance sheets of a syllabus for secondary schools, 1910. New York State Education Department, Albany. This pamphlet covers freehand and mechanical drawing and includes nine plates of mechanical drawing. It gives conventions and rules of practice and outlines four courses in mechanical drawing and one in architectural drawing.

Home Economics. Advance sheets of a syllabus for secondary schools, 1910; New York State Education Department, Albany. This covers foods and housekeeping, and domestic art.

Course of Study. A syllabus for elementary schools, 1910; Education department bulletin, May 15, 1910; published by the University of the State of New York, Albany. This syllabus went into effect in September, 1910. It contains illustrations of pictures for study, school buildings, problems in drawing and elementary handwork, shopwork, sewing, and cooking. The outline is especially well presented.

Proceedings of the Department of Superintendents. National Education Association. Dr. Irwin Shepard, Winona, Minnesota. This report of the Indianapolis meeting is sold at 25c a copy.

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MANUAL TRAINING MAGAZINE

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THE VOCATIONAL MIDDLE SCHOOL.

ARTHUR H. CHAMBERLAIN.

AN attempt to strike a new note, other than a discordant one,—a note full in harmony with the truth and the time on the subject of industrial education, would require a mind at once either brave or ignorant. For a score of years the clearest thinkers of our day have kept alive the fires of the industrial discussion, and every possible phase of the question has been repeatedly brought before us. Platform and press have been so aggressively active that the value of industrial education in the schools, in one or another form is no longer a matter for argument. As one writer puts it: "To the front with the men and the women who will give us a well-matured, feasible scheme of industrial education for our young people. Further discussion of the theoretic need of industrial education is simply churning buttermilk."

To this sentiment we can only give assent. That we are agreed as to the "theoretic need" of industrial education is a mighty step toward the accomplishing of results. To develop a "feasible scheme of industrial education for our young people" requires time, thought, and experiment.

In our primary and grammar schools we have in vogue, in all the more progressive larger cities in the country and in many of the smaller cities and towns, a more or less definite scheme known as occupation work, handwork, manual training, industrial education. Many elementary schools, both public and private, have fashioned their curricula with manual training as a leading feature. The polytechnic or manual training high school is a well-established part of our secondary scheme of education in all the more favored sections. Here and there is to be found a so-called technical high school, giving especial attention to industries, and now and again there springs into being an institution

teaching trades at public expense, and vocational and continuation schools are clamoring for a place. It will, however, require neither a brave man nor a wise one to declare without fear of contradiction that in few instances does practice in any or most of these schools bear out theory. *Manual training work* is the order of the day; real *industrial education* is not given.

A GENERAL TRAINING FOR ALL.

The exponents of industrial education are at the moment divided. There is one party with two wings. Every conference in which the subject receives consideration shows clearly this division. First, there are those who hold it the birth-right of every child to receive an education in the fundamentals. To be able to speak and read correctly, to write a clear, legible hand, to use figures accurately in ordinary business transactions, to be on speaking terms with the important facts and forces of history, to understand something of the geography of the earth and of man's relation, industrially and socially, to his environment, to appreciate good literature and to know the common laws of sanitation and of health,—all this is of first importance. In the grades, therefore, they insist, only general or typical forms of manual training shall be given, and no child, boy or girl, should be encouraged, or even allowed, to take up a particular or special line of work looking toward a vocation, trade or profession, until the eight grades of the elementary school have been completed. It is further insisted that before this time the student is entirely too immature to attempt a choice of vocation or calling; that the parent is likewise unable to choose wisely for the child younger than the high school admission age, and that frequently when such early choice is made, failure and disaster result, owing to lack of fitness and adaptability in the field chosen.

Again, a second class who look upon industrial education with favor say that thruout the country and especially in the congested districts of cities and manufacturing and industrial centers, it is absolutely imperative that boys, on leaving the grammar school, or at the expiration of the compulsory school age (usually fourteen years), step into wage earning positions. The necessities of the case demand this. The boy's own future demands it. The conditions of the home frequently demand it. An invalid father or one of little education and low wage-earning capacity, a widowed mother, a large family too young to assist in bread winning, financial reverses, sickness, disaster or other unfortunate condition exists and is more often the rule than the exception. If on

leaving school the boys and girls of this class have received no training other than that afforded in the regular grammar grades they are entirely unfitted to take up the duties of life. They must assist in the support of the family at once. And even in the event their services can be spared from the home for a longer or shorter period, there is no possibility of financing their way in a paid trade school for six months or a year. The high schools do not, of course, meet the needs of such students, even tho they should be able to attend them. These are the arguments presented to back up the proposition of the necessity for real industrial work in the last two years of the elementary school. Provision must be made in the seventh and eighth grades to meet the demands suggested and the early years of the high school must recognize the conditions and be prepared to develop further along vocational lines, those boys and girls who, with a particular end in view, seek its advantages.

A NEW TYPE OF SCHOOL.

When this second of the two platforms is analyzed we note that there arises a pair of possible alternatives: First, shall the grade school be so divided at the close of the sixth school year (at which time many boys and girls leave school, being then beyond the compulsory age limit) as to preserve for those who desire, the school work in its traditional form, and also to offer those who may so elect, a type of work looking towards one or the other of the more common vocations? or, second, shall the grade school and the high school be preserved intact as now, and a new type of school be organized covering the last two years of the elementary and the first two years of the high school? Either change would induce many to continue their education, not only into the seventh and eighth grades, but beyond this elementary stage into the secondary school, when otherwise they would leave at the close of the compulsory age.

Those who have followed closely the discussion thus far will realize that we are opening up the whole problem of elementary and high school instruction. This is inevitable, since the traditional barrier so long existing between the elementary and secondary school must be swept away. So far as time is concerned the eight and four year periods are to become twelve. In any readjustment of our elementary years of school we shall have in mind those school years that are to follow.

Boys especially leave the school in large numbers at the close of the sixth year because, first, the compulsory age limit permits them so to do; second, the work offered does not appeal to them; third, the organization of the elementary school wherein the work is given by one teacher, and

usually a woman, does not fit the needs of many boys. It is in the seventh grade that differentiation should take place. More and more boys should come under the influence of men teachers for a part of the school day at least, and the departmental system should prevail, thus giving not only a change of teachers, but specialists as teachers.

As early as 1903 in Boston the present writer emphasized the necessity of an "educational trade school" or a "vocational middle school." Such school should, as to grade, lie between the sixth school year on the one hand and the third high school year upon the other, with vocational training as the dominant element in its curriculum. This would provide for boys and girls who expect to close their school careers with the completion of the eighth grade and would hold many others who otherwise would leave at the close of the sixth year.

The seventh and eighth school years would thus be offered in two branches,—the one much as at present, and caring for those who are undecided as to their future or who are looking forward to specific work in the high school or beyond. The other branch will provide for those who desire training in a particular field. The work here would be well balanced. The humanities or so-called culture studies would be largely applied. The English should be of the every day available character; the geography should relate specifically to trade, commerce, industry; the history should embrace practical politics, lay a foundation for true citizenship and relate itself intimately to geography; the mathematics should be entirely applied to enable the student to handle his problems logically and easily and with perfect understanding.

But the general subjects should be none the less cultural on account of their being of real value. It would never do to lose sight of the imaginative element; the necessity for general training should always be kept in view. To think clearly, to judge honestly, to reason sanely, to act wisely and to preserve a wisdom that shall carry out and beyond the narrow field of one's individual activities is absolutely essential to happiness and to growth. For by "vocation" is implied not a trade of the shop simply,—the manipulating of tools and the handling of machines. The vocational middle school is not a trade school, but one in which the student shall be prepared or fitted to later learn the details of a trade. In this school there is added "to increased skill in technique and increased capacity on the quantitative side the ability also to plan and carry forward new lines of work. Nor is this all. The view is broadened; the work becomes less of a burden, and loses its aspects of

drudgery; and the individual is led to see his place in, and necessity to, the great social whole. Existence becomes life."[1]

COURSE OF STUDY.

This school shall include two years of high school work. Many who enter the first year of the course expecting to leave at the close of the eighth school year will desire to continue, and many who complete the regular eighth grade and to whom the traditional high school offers no appeal, will throw themselves with energy and enthusiasm into the vocational high school work. The courses shall be flexible, and at the same time so completely rounded out, that whenever a pupil leaves school he shall find himself in possession of that which is of immediate value to him in working out his life's problems.

In addition to regular book and traditional work, largely applied as has been shown, in business mathematics, history, government, commercial and industrial geography based on a physical and political background, English, drafting, design, the essentials of science instruction, physics, chemistry, biology, and such other work as is necessary, particular attention is to be given the industries. In this type of school more than a general knowledge of some one industry or trade may be secured and boys may specialize in cabinet-making, wood-turning, pattern-making, forge and foundry work, machine-shop, plumbing, painting, decorating, sign-writing, printing, bookbinding, designing, drafting, agriculture, horticulture, bookkeeping, accounting, photography, and many other lines of opportunity that may open to boys prepared in the vocational middle school.

Girls pursuing courses here may take their places as milliners, seamstresses, dress-makers, designers, bookkeepers, printers, photographers, landscape gardeners, laundresses, illustrators, bookbinders, workers in the metal crafts, etc. And in each instance the list may be lengthened to include all lines of occupation that naturally call to boys and girls of fourteen to eighteen years of age, and the fundamentals of which are adapted for instruction in the years of school indicated.

This, says some, is not a new doctrine. A beginning in these directions has already been made in several localities thruout the country. Segregation in certain localities has taken place at the close of the sixth school year; departmental work is being tried; special emphasis is laid upon the vocations; the traditional lines of work are being applied practic-

[1] Boston Address, N. E. A. Proceedings, 1903.

ally in the industries. While this is true, it is, however, a fact that force of circumstances has confined these experiments to a very limited field. In practically every instance where vocational work is given at public expense, it is carried on in a special school, with special equipment, under special teachers, and in such a way as to relate itself much more intimately to the trade than to education. The surroundings take on too early the shop atmosphere. That culture so necessary to the mechanic as well as to the musician, that in clerk and in clergyman alike is an essential element, comes not from books chiefly, but from association and contact with the best that society and the school can give. Hence the general and the vocational courses should be offered, not by different institutions of learning, but by the same school.

Another reason for this is that class distinctions are overthrown and discrimination as between the work of the shop, the office, and the platform is done away with where all work in company while pursuing different occupations. Class organization would, of course, be distinct, but the school family would be a unit. This method is also most economical as certain equipments may be used by all. Shops, libraries, studios, would in some instances require no duplication, and frequently there could be a profitable interchange of teachers. Those students inclined to the trade or vocation would, with better spirit, take hold of the distinctly school work demanded, while the presence of the industrial side would, little by little, make more real the traditional courses, and induce many to sympathize with or participate in them.

Students will also be led to appreciate the part played in the evolution of our civilization by the machine of the Yankee as well as by the myth of the Greek. They will understand the morality of labor as well as the ethics of the literary or professional world. They will preach the classics of industrialism and practice the gospel of equality.

Not long hince I visited the home of the General Electric Company in Lynn, Massachusetts, to study the apprenticehip system of that marvelous institution. Here come daily six hundred boys for practical work in the shops and for such other school studies as the authorities believe to be essential in the trades, emphasis being placed upon mathematics. These boys must have completed the eighth grade of the grammar school, or must pass an equivalent examination. For four years they pursue their work as mechanics, foremen, designers, etc., receiving from the beginning a small salary. Any indication of incapacity for the work in hand is a warning that the student is subject to dismissal.

THE LESSON OF THE APPRENTICESHIP SCHOOLS.

At a lathe in a machine shop was a boy turning out a simple machine part. This boy was serving his first year, and had piled beside him a score of completed parts, duplicates of the one upon which he was then at work. His average time required to complete the piece was one hour. The shop men who elsewhere in the institution had worked upon this same project required one hour and fifteen minutes average time. As a result the shop men have been relieved of this problem, it now being entirely in the hands of the boys.

This seeming discrepancy is accounted for on the part of the authorities by the fact that the men are engaged in piece-work. Hence, being anxious to turn out as many pieces as possible, they are careless and take inexcusable chances, thus ruining many pieces and increasing the average time for completing a perfect piece. The boys on the other hand, being paid for their time, are less likely to mistakes, and lower the average time. To me, however, there is a more fundamental explanation which gives an added significance to the whole matter. That young and inexperienced boys are, even in this simple operation, the superiors of men who have grown up in the shop may be, first of all, because the selective process has been carried on, only those being retained in the school, after a three months' probation, who give promise of thoro adaptability. It must not be overlooked, however, that the combination of school and shop training to which these boys are subjected and which the men never received, is, perhaps, the greatest asset.

The old apprenticeship system would have dictated, as suggested by the director, Magnus W. Alexander, that the boy on entering the machine trade devote his time to sweeping the office, dusting the furniture, or piling away stock. Time was consumed and the boy made no more efficient in his line of work. By combining the school and shop features and by entering at once upon the work in hand the boy is well on his way to a fair knowledge of the trade before he of the old system has touched his tool or machine. Moreover, the boy is at an impressionable age, receiving a training in the co-ordination of practice and theory, such as to make for his rapid advancement.

There is a significance in all of this for the school of today, and particularly for the vocational middle school. The happy combination of the particular industry involved and the distinctly class work brings quick and profitable returns. Whether the shop practice and class work are to be given, a half day of each, day and day about, or on alternate weeks

should depend somewhat on circumstances and conditions. With those beginning the course it is best that part of each day be given to shop practice, thus making early application of the class work possible. Later in the course the alternate day method would be satisfactory and as the student develops, the half week or the weekly change may be desirable.

As the schools more and more work in harmony with the commercial and industrial, the civic and the social interests, the latter method would prevail. Tradesmen will work in harmony with the school, taking the students in the final years of their courses and in some instances allowing a small compensation, this to be increased as the ability of the student warrants. The school is thus brought face to face with the problems of the every day world, and this contact can not but result in a better understanding by the business man of the school and all for which it stands. And on its part the school will by this contact grow out of much of the superficiality and theory and superstitution that has long attached to it.

THE SPECIAL AND THE GENERAL SIDE BY SIDE.

An additional reason, moreover, for developing the vocational middle school side by side with the grade and the high school lies in the fact that many who enter the vocational school, who otherwise would drop out entirely, will experience after a time a desire to complete the regular high school course and in some instances to go forward into the technical school or college. The contact with the general school work will aid pupils in reaching wise conclusions. This means that the work in both schools must be so flexible that without any serious difficulty students may pass from one year of either school to the next year of the other.

Whether the seventh and eighth grades of the regular school are housed with the other elementary years or in a building provided for the upper grades only, the vocational course boys and girls of like grade should, if possible, be housed with them.

So far is the regular high school has to do with this problem the courses therein must be modified and enriched to meet the growing demands of the day. The strong movement of the past few years toward the technical high school has been in the right direction. Now that attention has been universally called to the necessity for developing our secondary schools on the industrial side and because we have swung to the extreme in our desire to place in the field with the classical high school, the so-called commercial and technical schools of like grade, the reaction is already noted. "It is evident that the danger and friction

resulting from the presence of two or more distinct types of high schools in one locality, the classical upon the one hand and the technical upon the other, aside and apart from each other, is becoming increasingly apparent. My observations convince me more strongly than ever that the high school of the future is to be not a technical, an industrial, a classical, a commercial high school, but a *high school.* It is to be a school combining all the desirable features and subjects of instruction and one in which over emphasis will be given no narrow side of the work. Such a school is handled most economically and each student is given an opportunity to participate in those lines of work best suited to his needs."[2]

Such, then, is the type of school by the side of which shall develop, during the first two years of high school, the third and fourth years of the vocational middle school. And here again the work should be so flexible that interchange would be not impossible and class distinction never thought of. And thruout "I am pleading for a school, call it what you will, that shall be broad in its tendencies and thoro in the instruction offered; a school that shall have as its dominant idea such training in the industries as shall fit the boy to accomplish in the least time the maximum of work; a school that projects into its instruction thought and reason; a school that shall lead the boy to a more complete knowledge of the industries and of that for which they stand, and that shall help him to appreciate the lives, words and deeds of his fellows, that they may serve as a stimulus in the enrichment of his own life."[3]

[2] From a report by the present writer to the Board of Education of the City of Pasadena, April, 1910.

[3] Boston Address, N. E. A. Proceedings, 1903.

BOX FROM NIAGARA FALLS, NEW YORK, TECHNICAL HIGH SCHOOL.

HOW "SUBURBANHURST" LOOKED WHEN LAID OUT ON EXHIBITION.

ARCHITECTURAL DRAFTING IN THE MARYLAND INSTITUTE.

I. COMMUNITY BUILDING UNDER GIVEN CONDITIONS.[1]

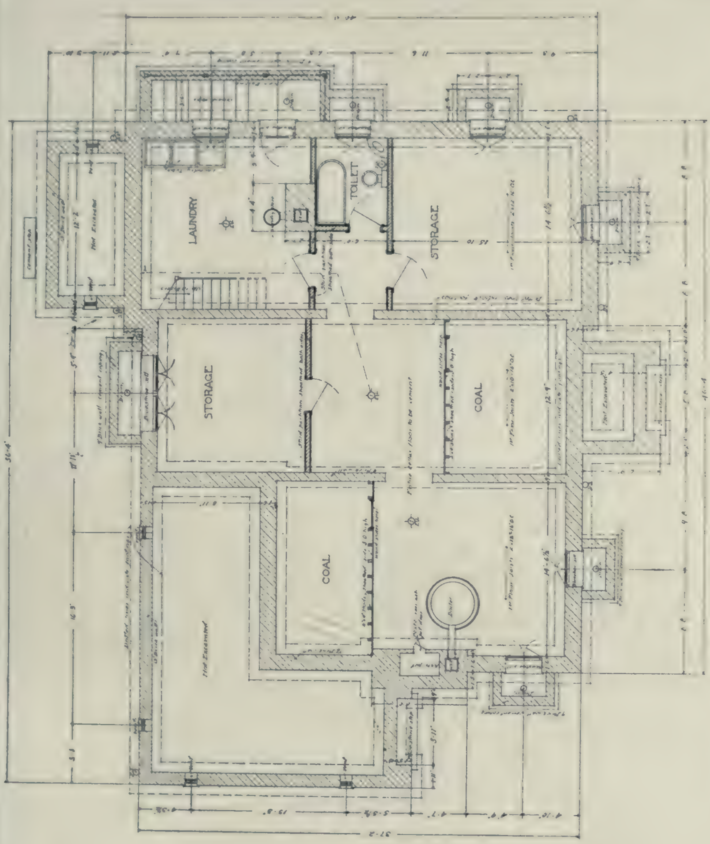
JAMES FREDERICK HOPKINS.

THE courses of architectural drafting in the Maryland Institute of Baltimore are an important part of the program arranged for the students of its night schools. The aim of this work is to develop that thoroly practical character and professional draftsmanship without which our students could be of little service in the architect's office, and that knowledge of methods and materials so necessary to the contractor and building superintendent. The result of this instruction show themselves in the manhood of the Institute's graduates, who have been widely influential in shaping the constructive activities of Baltimore.

In reorganizing and extending its courses in the architectural field, the Institute faced conditions, which, while they may not have been unusual or unique, were most interested, influential, and far-reaching. The interested elements of the problem were represented by the Board of Managers and the faculty, the majority of whom were actively identified with important establishments of the city and in the government departments in Washington. The influential forces that were brought to bear in friendly advisory fashion were the architects, mill-men, contractors, and builders. The far-reaching elements of this effort were the students of the schools, who came to us because, in the daily

[1]

routine of their busy wage-earning lives, they needed the instruction which the Institute offered. The problem which these conditions presented was not one which could be hidden from public view and a successful solution was not only vital but sure to carry with it increasing confidence and public appreciation.

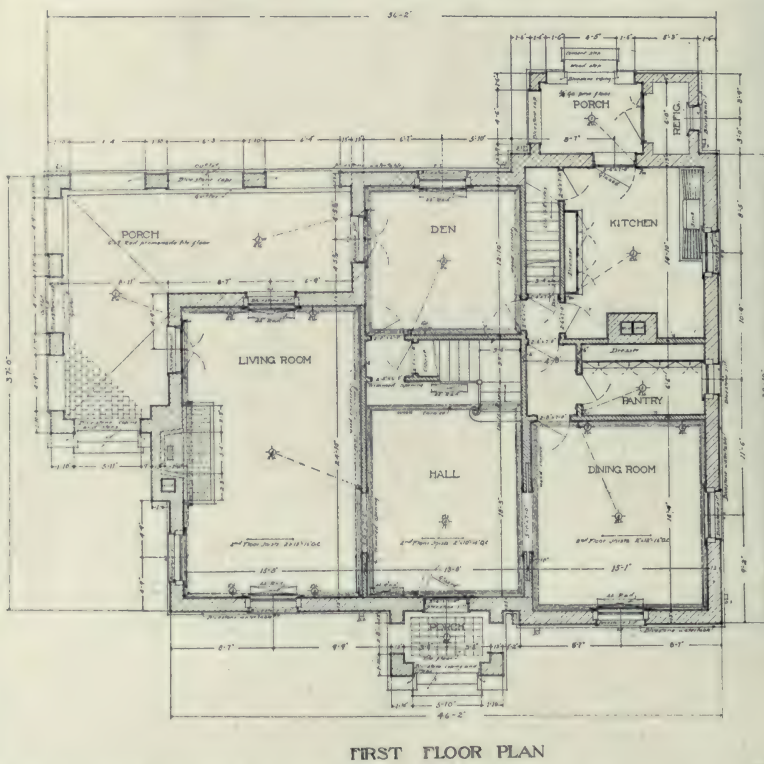


CELLAR PLAN

This plan, altho greatly reduced, shows clearly the conventions of rendering which will be noted also on the Sheet of Details.

On seeking counsel from architects one finds that they are by no means as united in opinion on the best methods of instruction in architectural drafting, as is the case among the engineers, machinemen, and constructors in the parallel subject of mechanical drawing. The architect, of necessity, is a man who knows and feels form, proportion, and

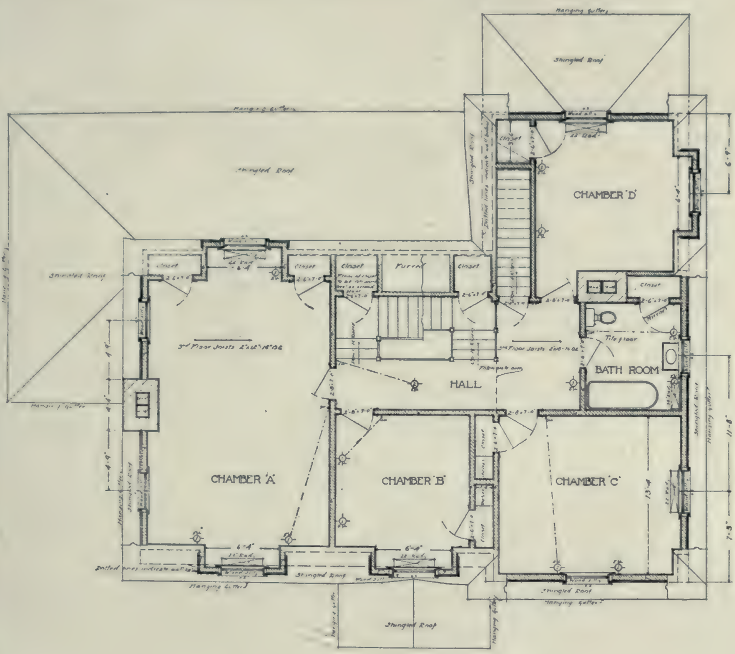
decoration to such an extent that he is more in the class with the artists, and consequently is a man of individual opinion and usually one who does not hesitate to express himself concerning educational courses. Probably the builders and millmen in any city could testify to an equally wide divergence of opinion among their architect friends concerning details and problems of their trade.



In developing the study of these plans, the drawings were first made on $\frac{1}{16}''$ scale, later checked and corrected on the $\frac{1}{8}''$ scale plan, and finally completed, as here shown, on the $\frac{1}{4}''$ scale drawing.

Millmen, on the other hand, have none the less important advice to offer, altho theirs is, of course, from the constructive and not the artistic point of view. They desire draftsmen soundly trained on "details" and able independently, accurately, and consistently to lay out full scale drawings for service in the mills or on the buildings.

Architects and millmen, however, are of one accord in doubting the wisdom of allowing some of the elaborate studies found in night schools, for the reason that few students, even those of a course representing four winters' effort, could possibly reach the state of mind or the power to do more than copy or render such ambitious projects.



SECOND FLOOR PLAN

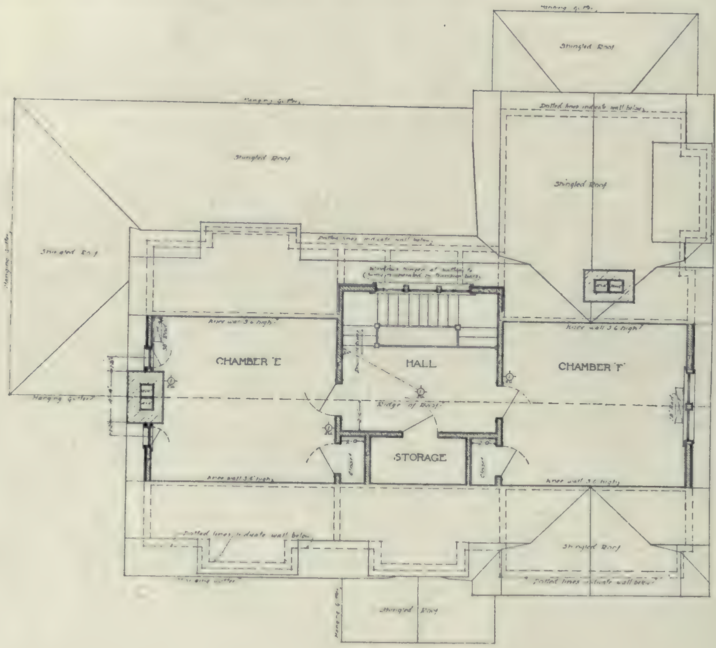
Into this study of planning went all the knowledge of details, construction, room arrangement, and domestic economy gained during the previous three years study.

UNITY IN EACH YEAR'S WORK.

should be given the utmost possible training and have his work so

The work of any night school, whether in the field of architectural or mechanical drawing, should be so organized that each section undertaken by the student will represent a complete unit of work. This is in keeping with a practice which is becoming very general thruout the country and which rests upon the policy that a man who enters a course

arranged that it rounds out, as far as may be practical, within the period for which he pays tuition. Therefore, in arranging, for instance, the work of a first year, we should not, as night school teachers, say to our students, "do this or do that and it will help you in your next year's work", or "start this train of thought and it will complete its story some time in the future"; rather should we make each exercise complete

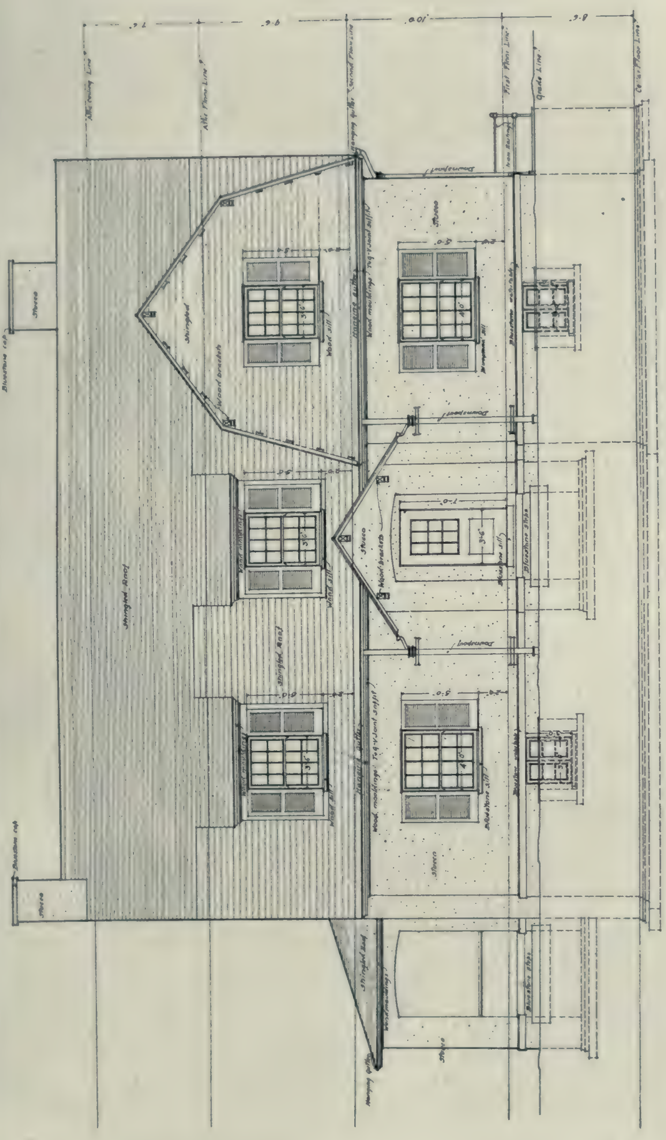


ATTIC FLOOR PLAN

In enlarging these plans to the ¼" scale, the students were greatly aided by a knowledge of roof intersections gained in preparing the model of the house. (see p. 129).

in itself, yet a step in a logical sequence, and so arrange the work that a student will go away from the classroom even on the first night, feeling that he has received a portion at least of the value for which he has just paid in tuition.

The first year work, therefore, arranges as a unit, the purpose of which is to give to an artisan who can spare only one year in study, the ability to read any ordinary drawings which may come to him in the



FRONT ELEVATION

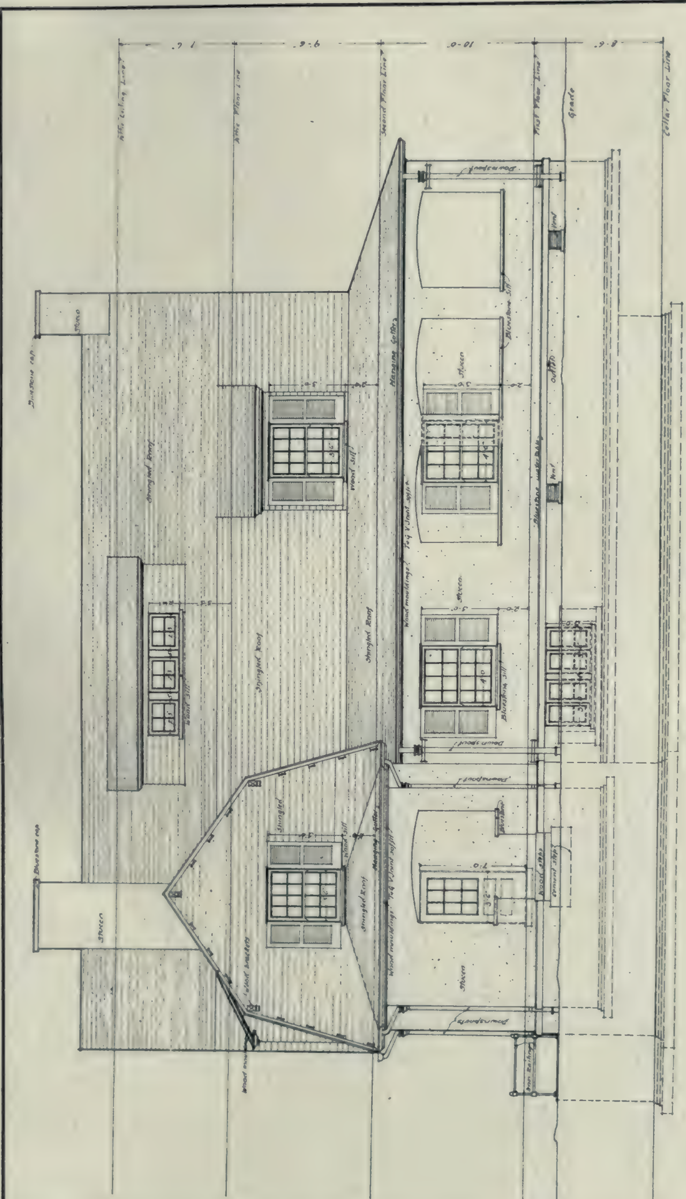
It has been a somewhat difficult matter to reproduce the student's original drawings, owing to the fact that while the principal ontlines were in black ink, the conventions of shingling, etc., were in brown.

field of building operations. To the man who can go on, the first and second years group as a unit, for while many men can enter only for one year and simply desire the ability to read drawings, others can go on and intend when they enter, to cover a two years' course. This continues the interest into details, framing, full-size detailing and special problems like stair-building in the field of frame construction. Those students who pass the second year and enter the third winter's work do so with good prospects of continuing to the end, yet for them the three years of study should be arranged as a unit. In such a case the specific work of the third year will carry forward the knowledge already gained into the field of masonry and framing details, full-size drawings, and the special problems incidental to brick, stone, and concrete construction. In addition to this purely constructive training, the students leave the third year reasonably well acquainted with practical methods of drawing the proportions of the orders of architecture, thus giving the knowledge necessary to lay out the detail drawings of porches, exterior or interior columns, pilasters, or moldings for the millmen.

The fourth year should suggest a course of study offering opportunities for assembling the known details studied thus far into constructions which should be of the nature of solutions of problems worked out under given conditions.

THE FOURTH YEAR PROBLEM.

Possibly a word concerning the conditions which had grown up in the fourth year class of the Institute may be of assistance to other teachers and suggestive in the solution of similar problems elsewhere. It should be stated at this point that the ambitious efforts of the students of this class were decidedly fostered by the fact that at least four money prizes awaited the successful graduates. Slowly but surely our boys, ambitious for these prizes and relying upon an unusual technique, had been undertaking problems which were in reality farther and farther beyond their depth. At the end of the year before the course was finally reorganized, we reached the limit of possibilities in this direction, in a series of sheets so remarkable in execution, so ambitious in size, and so unusual in technique that had they represented original work they would have suggested minds and hands mature enough and of such practiced skill that they could have been trusted with any reasonable problem. Practically, however, these beautiful drawings, while not actually out and out copies, were enlargements of projects so slightly modified that they consumed more time than the average student could possibly offer, and



REAR ELEVATION

All these elevations are the result of careful study of the half-tone and photographic prints, mounted for class-room use. The real problems of the winter hung on the development of interior construction and arrangement.

were rendered in a style so thoroly in keeping with office practice that no visitor to the exhibition had any difficulty in picking out the students who were actually employed in architects' offices during the day. Under these conditions it was not unusual for our boys to spend time during the summer hunting up material and even securing blueprints from professional offices in order to find some project sufficiently ambitious to shine above their classmates. The year the Institute occupied its beautiful Mt. Royal Avenue building, itself an epoch marking structure in American architectural practice, one fourth year student entered the school with his heart set on drafting that structure. He was only prevented from carrying out his ambitious project by the absolute refusal upon the part of his instructor to allow him to entertain the project.

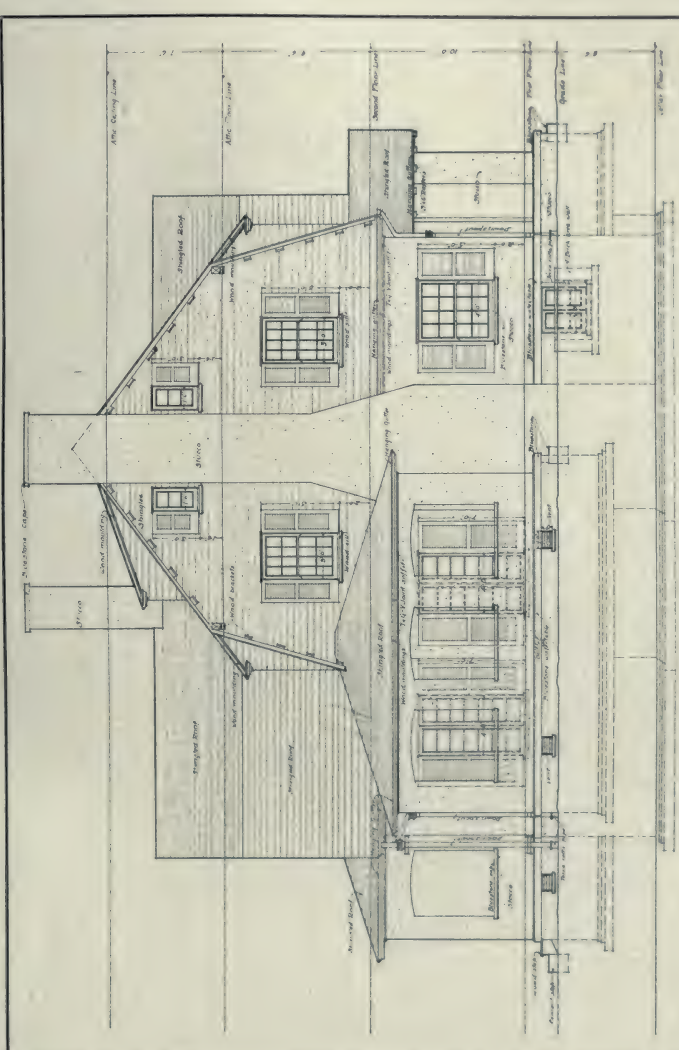
How to preserve all this enthusiasm, conserve all the power of technique accomplished in the preceding years, and at the same time to limit the work to a field of reasonable accomplishment has been a most interesting problem. It is useless to expect that any school could, during three years of about seventy sessions per year and representing, therefore, one hundred and forty hours of night classroom study per year, and possibly the same amount of home work, to bring a body of students to the point where they could actually originate, design, and delineate in the fourth year, even the most reasonable architectural proposition.

PLAN OF FOURTH YEAR'S WORK.

It was decided that the new work in this year should be limited to the constructive study of selected buildings of which illustrations of exteriors could be provided. The specific problem of each pupil was to take a chosen structure and from the elevations provided in photographic and half-tone prints, and with the knowledge which the previous three years' work had developed, to draw the plans, elevations, sections, and details of such structure in the most workmanlike manner possible.

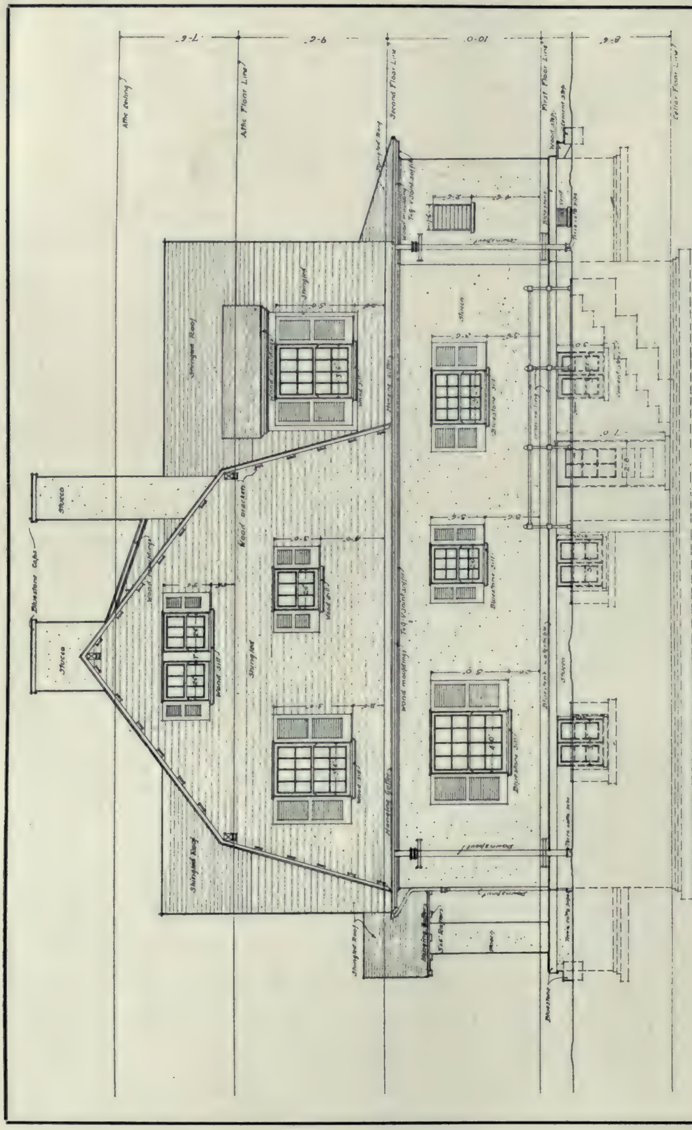
In order that a community spirit might be developed and a study of civic centers, street lay-outs, restrictions, and local interests be developed, a town site was imagined, its streets laid out, building sites plotted, and simple restrictions imposed. "Suburbanhurst" or, as the students of the class jokingly called it, "Spotless Town", came into existence, and the plat of the town was drawn out to scale for the students on the first night of school.

If our students came with too ambitious projects in mind for their winter's work; if they saw visions of libraries, court houses, post offices,



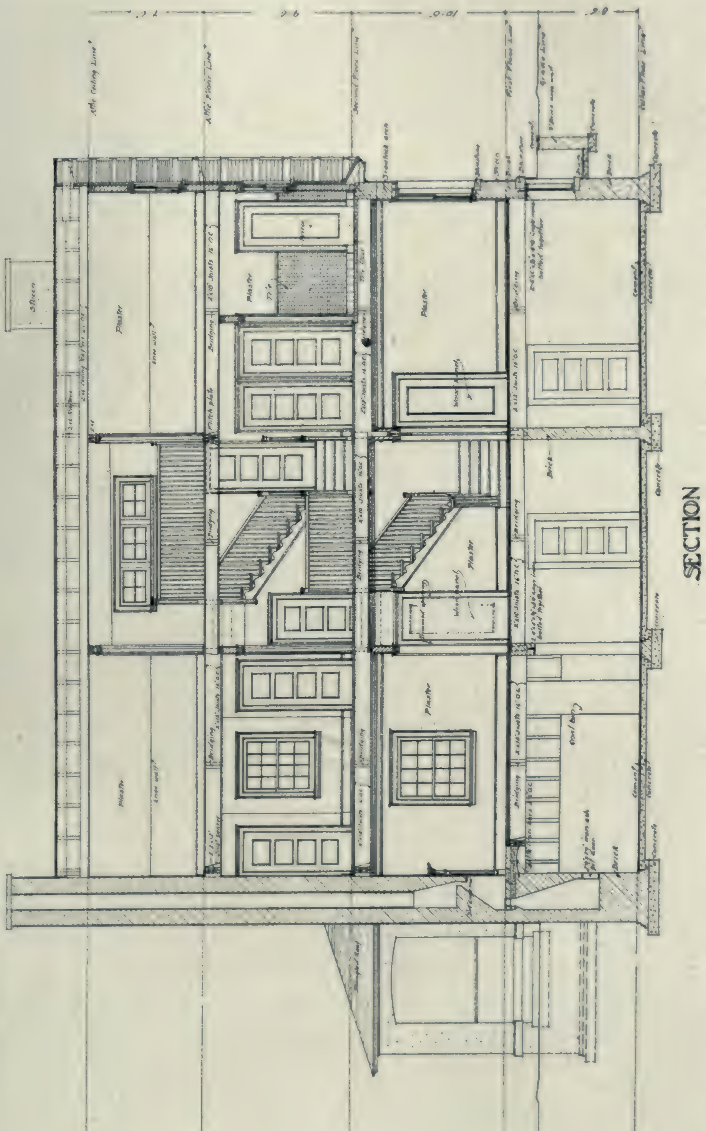
SIDE ELEVATION

In the note under the front elevation, reference was made to the use of brown ink in treating certain portions of the elevations. This method of rendering is of great value, for instance, in the details of French windows, blinds, etc., showing thru the openings of the porch.



SIDE ELEVATION

The reader will note on all plans and elevations in addition to the proper dimensions, conventions, etc., how carefully the student has lettered his drawing to show the materials used.

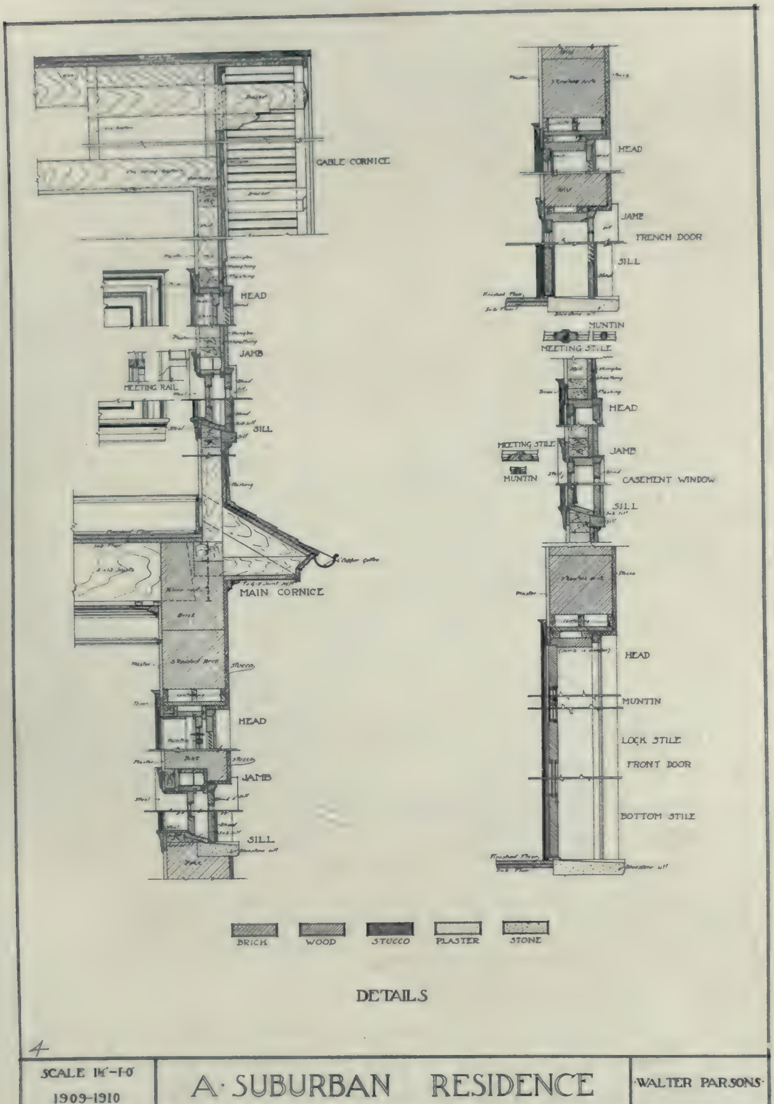


Every student was required, in addition to the plans, elevations, and sheet of details, to develop a carefully studied section of the cottage.

banks, country clubs, and mansions which were to grow upon their drawing-boards, they forgot them all in the instructor's interesting talk of how the town site came into existence. After his story of the village growth at the intersection of two turnpikes;—how the railroad came to town in later days, and a street was extended to the station; when the lake began to be appreciated, and where the boat-house was built; where finer churches replaced the earlier chapels; where the golf links were planned; how the woman's club was erected; and where the homes of the citizens were dotted thru the park-like development,—there was no question about preserving enthusiasm. If the students still had ideas of large size sheets which would astonish the judges when it came to later awarding the prizes, these thoughts were forgotten when they found that no building lot in "Suburbanhurst" was of sufficient size to be treated on other than an imperial sheet. Thus we tried to conserve all their power of technique, and at the same time to limit the work to a field of reasonable accomplishment. If they still had hopes of excelling their classmates in friendly rivalry, they found their problems enriched rather than complicated in the necessary recognition of the community spirit brought out under the simple restrictions laid down. So they drew lots for the projects suggested, after wisely giving the only woman in the class the opportunity to do the woman's club.

The results of all this effort showed in a year of unparalleled enthusiasm and in an exhibition of work which was more uniform than ever before in standard and technique. Not alone were the carefully executed sheets placed on view, but the models of the buildings which had been made at a certain stage during the year were also on exhibition under an arrangement which suggested the original town lay-out offered on the first night of the session.

In bringing these students thru a four years' course we have tried to place the work upon a basis which would appeal to the artisan. The work has been taught in a spirit like unto that which might have existed if in the first year classroom a boss carpenter had sat nightly upon the platform and looked down to see if the men were learning to read drawings. In the second year it has been as if the most expert millman looked over the room to see if students were making details which he would accept and could work from in his mill. In the third year the spirit has been the same as if a building superintendent was present to see whether the work offered in masonry and concrete construction was practical, and as if the broadest minded architect in town sat nightly in the fourth year room to see that the students acquired power which he could consistently employ in his own office.



SHEET OF DETAILS SHOWING METHODS OF LAYOUT AND DISPLAY.

The reader should bear in mind that all of these illustrations have been given very marked reduction, and in every case but the above, the standard borders and display titles have been removed in order to have the reproductions as large as possible.

RESULTS OF THE EXPERIMENT.

Certain specified details concerning the actual conduct of this fourth year work, as illustrated by the drawings of one of its students may not be amiss, and certainly should be of interest to other teachers engaged upon the same problem.

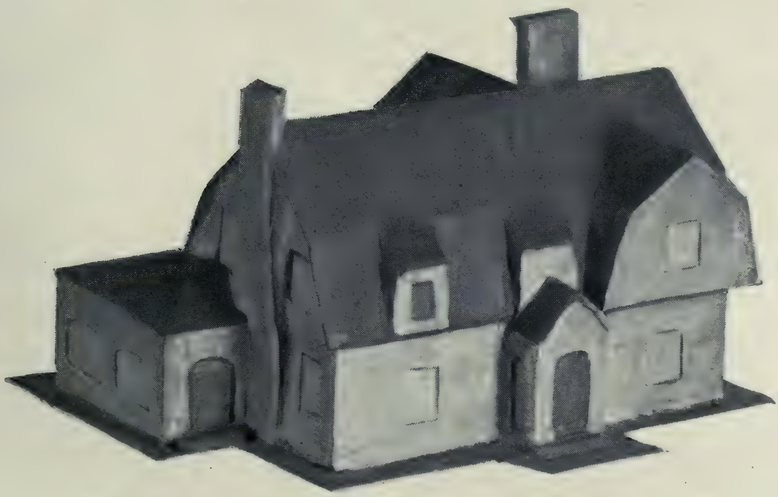
The material selected for students' study consisted of a series of elevations of buildings in half-tone or photographic prints properly mounted for safe use in the classroom. Wherever possible the different elevations were secured, together with such details as would be valuable in working out the plans and sections of the building. In addition to this photographic assistance, of which each student possessed illustrations of a different building, there was supplied a careful scale drawing of the plan and arrangement of the lots, streets, avenues, parks, and open areas of "Suburbanhurst."

As is the practice in many architect's offices the drawings were first started in more or less sketch fashion on a $\frac{1}{16}$-inch scale. These gave studies which could be easily carried around in pockets, consulted at any time and corrections made without difficulty. Naturally this first sketch study was early worked into drawings on $\frac{1}{8}$-inch scale, which gave opportunities to check, correct and modify any of the details of the general scheme.

After the completion of the $\frac{1}{8}$-inch scale drawing came the modeling of the house in cardboard and composite clay, not so much in the desire to turn out a finished model as to study in three dimensions such complications as roof intersections, proper balance of masses, and relation of details on one elevation to those on the elevation adjoining. It was these simple models, somewhat hastily constructed, but of none the less sound educational value, which at the end of the year were repaired and tinted and took their place in the exhibition of the season's work.

The drawings which represented the more finished studies were made on $\frac{1}{4}$-inch scale, and offered opportunity for as careful workmanship and thoughtful treatment as the class was capable of accomplishing. In selecting a series to illustrate these notes no effort was made to work over or modify in any way the actual work of the student. The reader should bear in mind that the examples presented have been given very marked reductions and in order to have the illustrations as large as possible the standard borders and the display titles have, in every case but one, been removed. The only work of the year which has not been

reproduced, are the studies in elementary composition, consisting of the application of the orders and architectural elements produced in the preceding year. It would, of course, be equally unnecessary in a paper of this character to attempt to outline the parallel course of shades, shadows, and perspective; the lantern lectures on the outlines of art history; or the application of formulas, the graphical analysis of trusses; or the practical talks on heating, lighting, and plumbing.



THE MODEL OF THE HOUSE IN CARDBOARD AND COMPOSITE CLAY.

It was not so much the desire to turn out a finished model as to study in three dimensions such complications as roof intersections, proper balance of masses, and relation of details on one elevation to those on the elevation adjoining.

BOOKBINDING IN THE SCHOOL.

George William Eggers.
Oscar Lincoln McMurry.

III. TYPES OF DESIGN PROBLEMS IN THE BOOKBINDING COURSE.[12]

DESIGN must make pupils think. Whether this is true of any other subject in the curriculum or not, design must make pupils think or it fails completely of its purpose in the school.

Every other subject has some informational value which is of more or less direct use in the life of the individual. Even if he brings the minimum of creative power to bear on any other subject, he will take away from it some facts which may be of some use to him some time. Of information design gives next to nothing that is worth the carrying away. Design, in this sense, is indeed not a "subject" at all, but rather a habit of mind—a cross-section so to speak—running thru all subjects and coming most conveniently to a focus in the Arts.

The word "design," as we use it, is allied in meaning to the word "intention." It means, "an expressed or marked-out intention." The study of design implies a cognizance of conditions and a response to them.

PURPOSE OF DESIGN IN EDUCATION.

Design must make pupils think, but that is not all. Design must so continuously and so consistently make pupils think, that the habit and kind of thinking which it sets up will exercise itself spontaneously in every act; not only in the making of a footstool, but in the arranging of the notes on the pages of a science note-book; not only in the painting of a landscape, but in the planning of an afternoon's entertainment. A man who saw the boy Lincoln piling wood, said: "That boy will be president yet." Design, an understanding of conditions and a well-considered response to them, characterized every step in Lincoln's career.

So primarily we must think of design, not as a scheme for decorating things; not as a science of space division; not as a formula to test whether or not a thing is "good art," but as a habit of mind—*an emphasis upon that which goes before* the actual execution of any piece

[12] Copyright, 1910, George W. Eggers.

of work in materials. Regarded as a study of, and a response to, the conditions which surround any problem, design implies a habit of systematic scrutiny and inference.

This is the point at which art teachers and teachers of handwork most frequently "fall down." Many construction teachers think of art as a beautifying process which of course follows the "necessary" part of the problem, and many teachers allow them to go on thinking so, being no more enlightened themselves. The day has come when the art teacher must know something more than mere "space-breaking" and "color-harmony" if he is to serve the needs of a great industrial civilization.

Can *young* children be taught design? As an informational subject, No; as a development of esthetic judgment thru space division and the making of "plaids," probably not; as a habit of mind, as a habit of systematic and careful thinking before execution,—*Yes,*—and from the beginning. There is no time at which children are too young to think before they act—to look before they leap. Indeed, if this element of scrutiny and consideration is omitted from their activities, where is the educational import of those activities?

The conditions of any problem in the arts will classify themselves in general under the head of *need* (with all that goes to qualify that idea) and resources (covering materials, time and skill involved). The nature of the material which the need calls for forms within itself another circle of conditions; and these together with the resources at hand, determine the limits of what may be done. This much being fixed, the problem for the pupil is to meet the combination of circumstances—and to meet it *in the finest manner possible.* In the factory, as we have seen, the element of economy of time, of material and of intelligence involved in the execution would constitute other conditions, so that the factory problem, being hedged round with limitations, does well when it is carried out in a way that is even adequate or good enough. But because the school aims at the growth of the individual, it dares not ignore those most occult demands which we call the love of beauty—the esthetic possibilities of the problem. There is a certain ethical aspect of industrial education as a result of this. The pupil's responsibility is to meet the conditions in the finest way he can conceive—and at the same time to study for finer and finer ideals in the matter. "Well, *I* like it," is not final.

And what are the esthetic possibilities of a problem? Mechanically stated, they are merely subtler adjustments of proportion, form, and color

to satisfy the eye which must see, and the hand which must feel. Educationally, their importance lies in their bringing forward for the pupil's respect, his own individuality, and in their leading him ever deeper and deeper into a study of the circle of conditions which we know as a problem, in their leading him to a finer scrutiny of things made as well as things to be made. The esthetic possibilities therefore do not lead away from, but deeper into, the other conditions of the problem. The highest freedom of the individual lies not in the disregard of law, but in the voluntary and spontaneous regard for ultimate law. Mechanical efficiency and esthetic beauty cannot be divorced. The project is well designed only when *all* the conditions are met.

The pupil who has really had an experience in design feels an impelling reason for every line, color, proportion, and structural device he has chosen to use. The height to which he himself has raised his problem in the solution of it, is a measure of his capacity for thinking.

RELATION OF DECORATION TO THE PROBLEM.

What is the relation of decoration to the problem? Design does not mean decoration. Decoration is embellishment which may be dispensed with, leaving the usefulness and character of the object unimpaired. The design is the form and character of the object itself. Design—structural design—must be a settled thing whether decoration is attempted or not. The principles of design—the principles of fitness, congruity and significance become the principles of decoration when the latter enters the problem.

Decoration in its length and breadth is a detailed and highly technical subject. Its field is too wide to be entered at random. The principles of most general significance should be mastered, even if the subject cannot be pursued into its ramifications. A feeling for arrangement, for order as the ideal in decoration (so that decoration may always be, as much as possible, an organic part of the thing decorated) is a far more important quality to cultivate in pupils than ingenuity in the devising of units. And yet the latter receives twice the attention of the former in most design classes.

The fundamental and inexorable law of decoration is that it must in some way strengthen our impression of the object decorated. The decoration must relate to the object as the leaves to a tree. It must be the ultimate expression of the form and character of the object. It must give the impression of being inevitable. For this reason decoration must

be significant—that is, in every possible way, peculiarly appropriate to the object decorated; and for this reason, too, it is better that the decoration of any object be such that it escape our notice rather than force itself upon us. The part should never be greater than the whole.

If structural design calls for thinking, decoration calls for thinking to an even greater degree, since decoration rapidly multiplies the number of elements to be controlled. The process of planning decoration should, therefore, be laid out systematically and should develop from the designing of the object itself as a natural process of growth.

The steps in the planning of any decoration are, *first,* deciding on the regions and areas to be decorated, opposing these to the areas to be left undecorated, studying for the finest possible relation of proportions between decorated and undecorated areas (the first step in creation, the separating of "light from darkness"—"order out of chaos"); *second,* breaking up the area to be decorated into its larger elements—groups of units or individual units; and, *finally,* working out the form and drawing of the unit to fit the space so evolved. This process admits of the exercise of judgment and the play of esthetic feeling at every step of the problem. It admits of a testing of the important decisions (the large massings which strike the eye first) before the lesser ones which depend upon these, come up. It gives the designer the opportunity to stop early in the process, leaving his design large and severe, or to refine and refine these large shapes to a condition of exquisite detail if his skill is adequate. "The true work of art is finished from the time it is commenced." This method of watching the design as it grows under the hand, keeping in readiness to halt it, or else to follow where its suggestion leads—this makes room for those infinitely subtle discriminations which are the true spirit of fine art—at the same time it preserves the needful organic relation of decoration to object decorated.

ESTHETIC POSSIBILITIES AND LIMITATIONS IN BOOKBINDING.

The educational value of the subject of design rests, to a great degree, upon the fine balance it maintains between "rights and responsibilities;" that is, between the spontaneous and disciplinary aspects. Of course, problems are conceivable which are too lacking in freedom of choice to have any educational value at all—problems in which the nature and direction of the pupil's activity is practically settled for him; on the other hand, problems are conceivable in which there is so much freedom that the pupil's activity becomes a go-as-you-please race, lacking

any direction whatsoever. Really educative experiences are to be found in the middle ground between these two types.

Bookbinding as an art-craft affords an excellent balance between possibilities and limitations. The materials of book-binding are for the most part limited in form to what may be called two-dimensional; on the other hand, in color and texture they are practically limitless. Again, the shape of the book is in general limited to the rectangle, but the purpose for which the book is designed may influence the proportions of this rectangle to an almost unlimited extent. Again, the elements of the book remain always about the same, namely, pages and covers—but the range of the contents of the book is limited only by the range of human thought itself. To the designer the consequence of all this is: there is an infinite range for the imagination, an infinite variety of colors, textures, forms and proportions in which the images may be expressed, and at the same time there exists all the character and force which the *specific* idea of the *particular* book imposes, and which the flat rectangular surfaces and the ordered pages and the protecting covers by their own nature dictate.

"Of the making of many books there is no end." A series of book-making problems designed solely to afford experience in putting materials together is, like many current practices of the school, pretty wasteful of the time and energy of the pupil. "Books for books' sake," is about as futile an idea as "Art for Art's sake." A book without its individual purpose, arising from a particular need is, educationally, a book without form or character. One of the most important elements in the book-binding problem, as in other constructive activities in the school, is the adapting of form to particular purpose.

Specifically, then, when a child sets out to make a "blank book," let us say, give him a chance to make some *kind* of blank book—a blank book to satisfy some need which he understands and is able to analyze. "It isn't any particular *kind* of a dog, it's just a dog," is no compliment to the animal in question. So with the book. The science note-book, the journal of temporary class-jottings, the quotation book—each may have its defined character, with this character expressed in every element. Every proportion, every bit of material selected for color, for texture or for its suggestive quality, every touch of decoration may be significant, all but inevitable, or it may be meaningless. Is not here an opportunity for the development of fine and subtle thinking—to some extent even with the very little people, since the problem is most concrete—for close scrutiny of the particular needs of the case? Is not the

meeting of need in its subtlety the typical "life-problem" in its most ideal form?

And so in the rebinding of the printed book, will not the character of the contents, the literary style itself, the character of the page, the connotations of the text, the very condition of the particular copy—all conspire to suggest the garb in which they must be clothed? And if, in rebinding our text, we recognize these still small voices, will we not make our own product the more worthy and ourselves more and more sensitive? Cobden-Sanderson, in describing his rebinding of a precious old tattered copy of the Poems of Bobby Burns, recalls how he set it into a cover of heavy dark material and traced upon that cover a flaming design in gold, adapted from some splendid ragged wayside weed—and so commemorated upon the cover not only Bobby himself and his homely, warm and vigorous song, but at the same time the homely, well-worn character of the pages within.

In the essays upon the design element in bookbinding, we have dwelt at some length upon theory, and upon the spirit in which problems should be approached. The esthetic is, after all, far more a matter of attitude of mind than it is a conformance to any particular canon of beauty. In other essays of this series, however, we shall endeavor to illustrate specific types of orderly arrangement, and by illustration and text point out kinds of work which we hope may help to clear the pathway for this emotional esthetic expression and discrimination.

IV. PROBLEMS FORMING THE FIRST GROUP.[13]

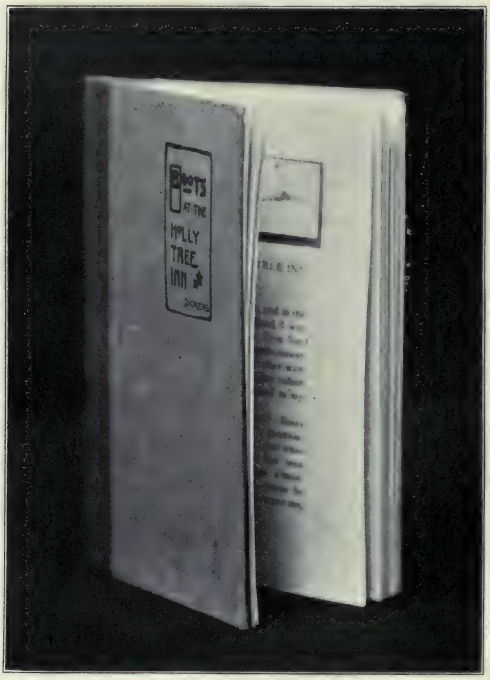
(*Continued.*)

A course of study in a given line, while apparently a formal affair, is in reality an expression in advance by a teacher of the probable direction and range which children's thoughts and constructive efforts will take in work in a given subject.

A teacher having the child's point of view will see to it that the course outlined is not only in line with his immediate play and work interests, but that the solvable parts of the problems are not gaged too high nor too low with reference to his abilities. He will see to it that the child has freedom within limits in expression of ideas both in the matter of sketching for design and in planning for final execution.

[13] Copyrighted, 1910, Oscar L. McMurry.

The series of problems in bookbinding, while arranged in groups having certain constructive elements in common, must satisfy the child's immediate needs in order to engage his full attention. The greatest freedom should prevail in the making of books in the matter of determining proportions, selection of materials and treating of decoration.



ONE-SECTION PAMPHLET MADE INTO A SEVERAL-SECTION BOOK. CASE BINDING.

Now it goes without saying that children of the lower grades with a very limited acquaintance with printed matter will have ample opportunity to exercise great freedom in the making of blank books to contain their clippings, sketches, word lists, compositions, etc.

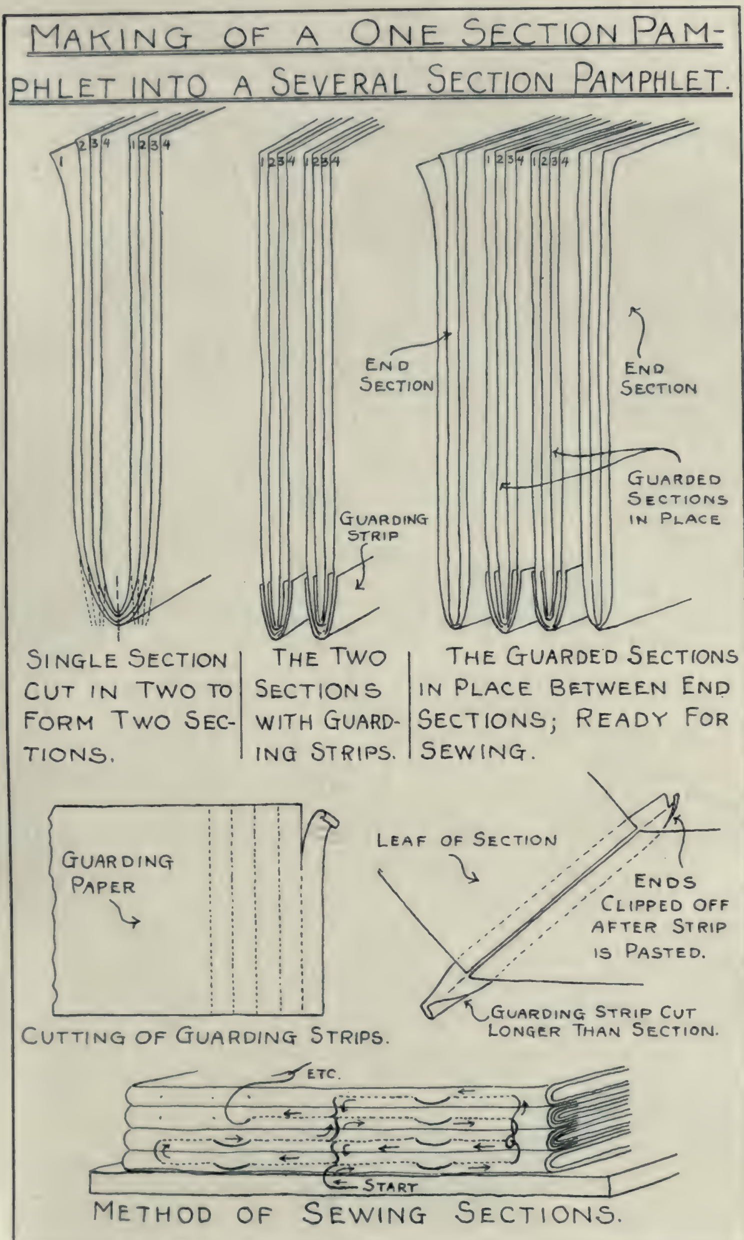
Children of the intermediate grades would naturally get experience in the binding of both blank and printed matter, while advanced pupils center their interests in the binding of the printed matter. This is the logic of the situation, inasmuch as the ideal we have set up is to develop power on the part of the children in the grades to select, bind and appreciate a library bound book.

8. Making a one-section pamphlet into a several-section book.[14]

(Grade VI.) Printed matter in the form of one-section pamphlets, reading leaflets or selections from magazines may be bound as described in Problem 5, p. 22, and as fully illustrated on p. 26.[15] It may be desirable by reason of the many leaves in a section or unusual thickness

[14] NOTE: This is the eighth problem in the series and the second under B. Several Section Books.

[15] See October, 1910, number.


MAKING OF A ONE SECTION PAMPHLET INTO A SEVERAL SECTION PAMPHLET.
1 2 3 4 1 2 3 4
1 2 3 4 1 2 3 4
1 2 3 4 1 2 3 4
END SECTION
END SECTION
GUARDING STRIP
GUARDED SECTIONS IN PLACE
SINGLE SECTION CUT IN TWO TO FORM TWO SECTIONS.
THE TWO SECTIONS WITH GUARDING STRIPS.
THE GUARDED SECTIONS IN PLACE BETWEEN END SECTIONS; READY FOR SEWING.
GUARDING PAPER
CUTTING OF GUARDING STRIPS.
LEAF OF SECTION
ENDS CLIPPED OFF AFTER STRIP IS PASTED.
GUARDING STRIP CUT LONGER THAN SECTION.
ETC.
START
METHOD OF SEWING SECTIONS.

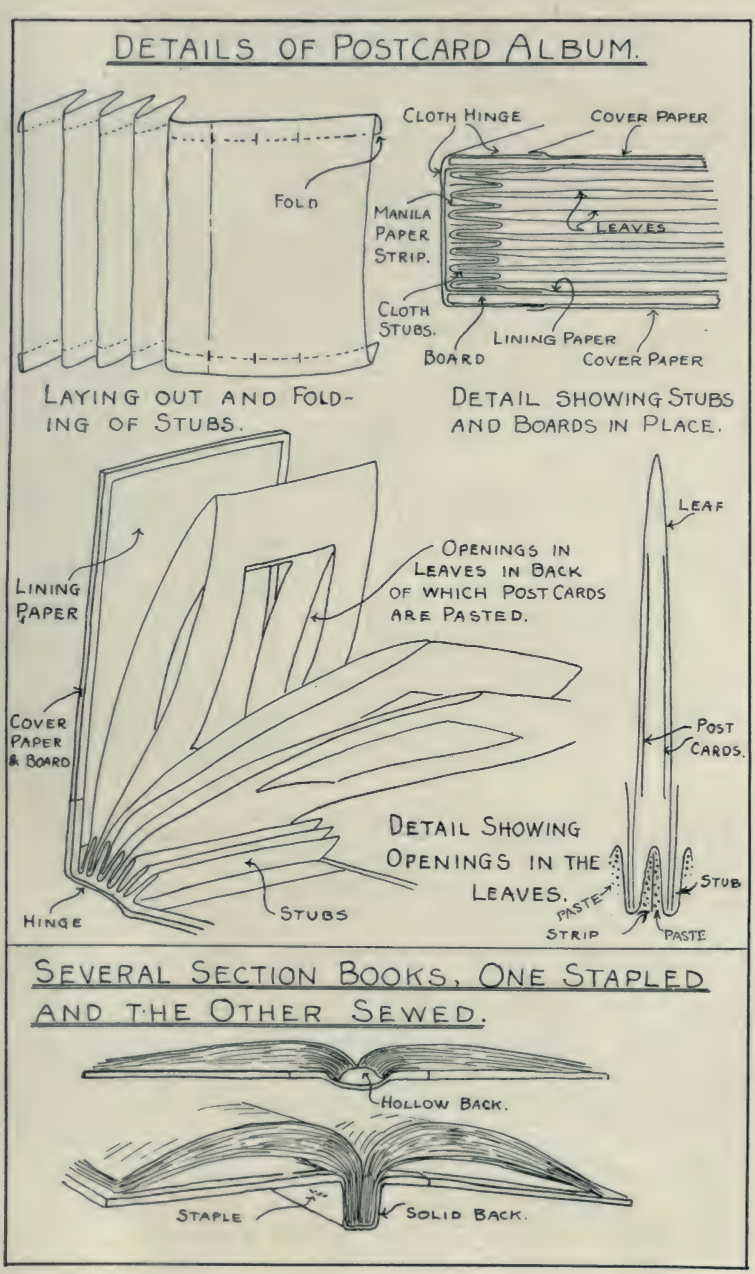
of paper, to bind these one-section pamphlets into thicker books with more shapely backs.

The pamphlets with covers removed, threads cut or staples removed may be subdivided into 2, 3, or 4 sections, as the number of leaves

POST-CARD BOOK. BOARD COVERS, CLOTH STUBS, LEAVES FOLDED WITH CARDS BETWEEN.

may warrant. This is done by cutting the leaves thru the fold, forming the leaves into the new groups—and guarding the leaves in pairs. New folds are thus necessary for every two leaves. Care must be exercised in having the leaves properly paired and grouped so that the paging will be correct. Light weight bond paper should be cut into strips varying in width from one-quarter inch to three-eighths inch (as needs may require). The strips should be cut with knife and ruler on board. Guarding strips may be cut an inch or so longer than section, so that tips may be free from paste in putting in place. The guarded leaves may be left in the flat till dry, then folded with care, gathered into sections and pressed.

Paper for end sections should be selected with reference to the paper in the books as to weight, tint and texture. It may be desirable to have the same number of pages (and necessarily of the same size) in the end sections as in the printed sections. These sections may be sewed as shown in Problem 7, Address Book, p. 25, or with one needle as indicated


DETAILS OF POSTCARD ALBUM.
FOLD
LAYING OUT AND FOLDING OF STUBS.
CLOTH HINGE
COVER PAPER
MANILA PAPER STRIP.
LEAVES
CLOTH STUBS.
LINING PAPER
BOARD
COVER PAPER
DETAIL SHOWING STUBS AND BOARDS IN PLACE.
LINING PAPER
OPENINGS IN LEAVES IN BACK OF WHICH POST CARDS ARE PASTED.
COVER PAPER & BOARD
HINGE
STUBS
DETAIL SHOWING OPENINGS IN THE LEAVES.
LEAF
POST CARDS.
STUB
PASTE
STRIP
PASTE
SEVERAL SECTION BOOKS, ONE STAPLED AND THE OTHER SEWED.
HOLLOW BACK.
STAPLE
SOLID BACK.

in detail drawing. The book may have case binding as indicated in details of address book, p. 24.

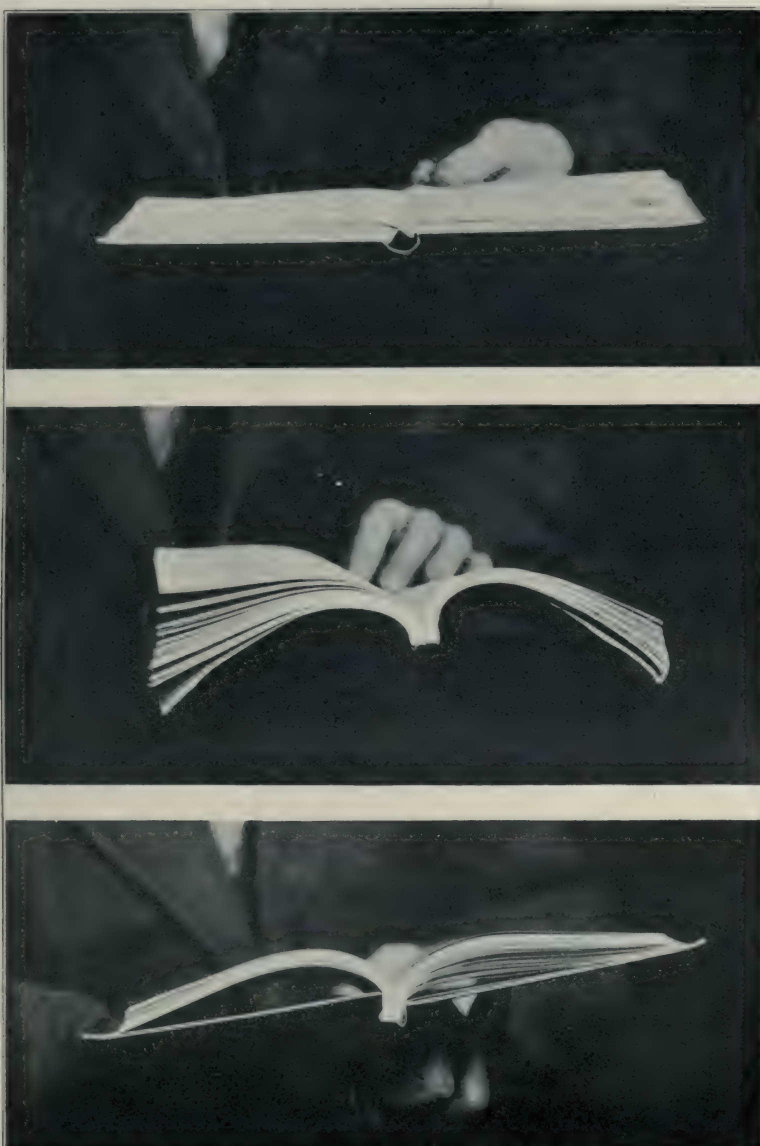
9. Construction of a Post-Card Book to hold a series of cards already selected. This problem involves, as a preliminary to the planning of

CLIPPING CASE. BOARD COVERS, CLOTH STUBS, ENVELOPES.

the book, the selection of the cards and may mean many excursions and criticisms of collections. Experiences valuable to teacher and pupils may come as a result of the careful working out of the details of this problem. The character and number of cards being determined, sketching for placing one or more cards on the page with due regard to margins will determine size and proportions of book.

Selection of materials for cover, leaves and stubs involves a study of textures and color in connection with those indicated in the pictures.

The book as detailed is a several-section stub book made of sheets having the fold at the fore edge. The stubs are made from a single strip of cloth in reverse folds, as shown in Problem 6, the Sketch or Silhouette Book, p. 22. Each page is a mat for the post-card picture. The card is inserted and held between the leaves as indicated. The holding medium thruout the construction is paste—no thread or cord being used.



a. SECTIONS OF PRINTED BOOK. BOARD COVERS, SEWED THRU FOLD, HOLLOW BACK.
b. MAGAZINE, STAPLED THRU SIDE, PAPER COVERS.
c. SUPPLEMENTARY READING. BOARD COVERS, SECTIONS STAPLED THRU SIDES.

10. Clipping Case. The details of the post-card book as to stubs and cover are utilized in this construction. The problem involved is the construction of an envelope with plaits, tongue, slit, etc. The clipping case problem calls for sketching for proportion to meet the conditions imposed by the envelope requirements. Then follows selection of materials, working out of details of envelope and case.

SOME CONSTRUCTIVE DETAILS FOUND IN MAGAZINES AND TEXT-BOOKS.

The binding of several-section books leads us into the field of magazine and text-book construction. Paper covers, stapled sections and glue give a very unsatisfactory product, not only in the handling, but in the preserving. Does the possibility of rebinding justify this method of construction?

Text-books and supplementary reading with board covers sometimes have stapled sections and solid backs. Text-books and supplementary reading made up of several sections are sometimes sewed thru the fold, finished in boards, hollow back, etc. Such books are in strange contrast with the stapled and glued constructions just mentioned.

(*To be continued.*)

FROM PROVIDENCE, R. I.,
TECHNICAL HIGH
SCHOOL.

VISITING MANUAL TRAINING SCHOOLS IN EUROPE.
VII.—PARIS.

Charles A. Bennett.

BEFORE going to England I spent a month on the Continent visiting schools in France and Germany. Our boat reached Antwerp on Saturday, the day after Christmas, 1908. I shall not soon forget my first view of the green banks of Holland on that gray morning, nor the delights of the voyage of the Scheldt River with its varied craft constantly in the foreground of a hundred horizontal landscapes, and the slowly enlarging view of Antwerp as we approached nearer and nearer to the picturesque city of our destination. Neither shall I forget my first sensations as I entered the dimly lighted interior of the great cathedral which I visited on the first evening as soon as my trunk was safe in the room at the *Hotel de Grand Labourer.* Fortunately the next day was one of the great festival Sundays of the year, when all the famous pictures in the cathedral were uncovered, and the choir rendered its grandest music. I went early and remained thruout the entire morning. During the first service I occupied a seat in full view of Rubens' great masterpiece, the "Descent from the Cross," and where I could also look up into the dome and see the "Assumption" by Schut, a most appropriate painting for the place it occupies. During a later service, when the well-to-do people of Antwerp nearly filled the great building, I spent most of the time in one of the small chapels from which I could get the best view of the high altar piece by Rubens, the "Assumption of the Virgin." During another service I was in the south aisle, studying the "Passion" in fourteen scenes painted in the medieval style by Vinck and Hendricks. And so it was thruout the day, and in fact thruout my stay in Antwerp, whether at the cathedral of Notre Dame or the Church of St. Paul, the Church of St. Jacques, or at the Plantin Museum, or the Royal Museum, I was constantly in sight of some masterpiece of art and handicraft. If it was not a famous painting by Rubens or one of his followers, it was one of the world's masterpieces of wood-carving, such as the famous confessional in the Church of St. Paul, or some of the beautiful books printed and bound by Christopher Plantin and his

son-in-law, Mortens, or such wrought iron work as the canopy by Quintin Matsys, which is over the well in front of the cathedral.

But no schools were in session in Antwerp, so I hurried on to Paris, not even stopping in Brussels, where I had hoped to visit several schools. I reached Paris in a severe snowstorm when the smooth-shod horses were falling down in the streets and the motor vehicles were demonstrating their superiority over all the others. In Paris I found American friends ready to welcome me, and so the remainder of the holiday season was spent, as it was begun, in sight-seeing and study in the museums.

FIG. 88. SALICIS SCHOOL, PARIS.

The delay in getting my official letter of introduction from the office of the American Ambassador caused me to visit schools in Germany before France. However, when the letter came, it was effective in securing from the secretary of public instruction the desired permit to visit eight schools, but without the permission to take photographs in these schools, which he said was against the rules of the office. Finally, after persistent effort on the part of my efficient guide, the secretary was kind enough to add to my permit *"et à preude quelques vues photographiques,"* and as a result I am now able to present to my readers the illustrations in this article.

VISIT TO THE SALICIS SCHOOL.

The first school visited was the historic *École Salicis,* at 33 Rue Tournefort, only a few short blocks from the Pantheon. The appearance of the exterior, Fig. 88, is not unlike that of many other old buildings found in the city of Paris. We passed in at the gateway beyond the building and soon found ourselves in an open courtyard, whence we were conducted up a winding staircase to the office, where we met the principal of the school, A. Baudrier, who received us most cordially and personally conducted us thru the several departments of the school.

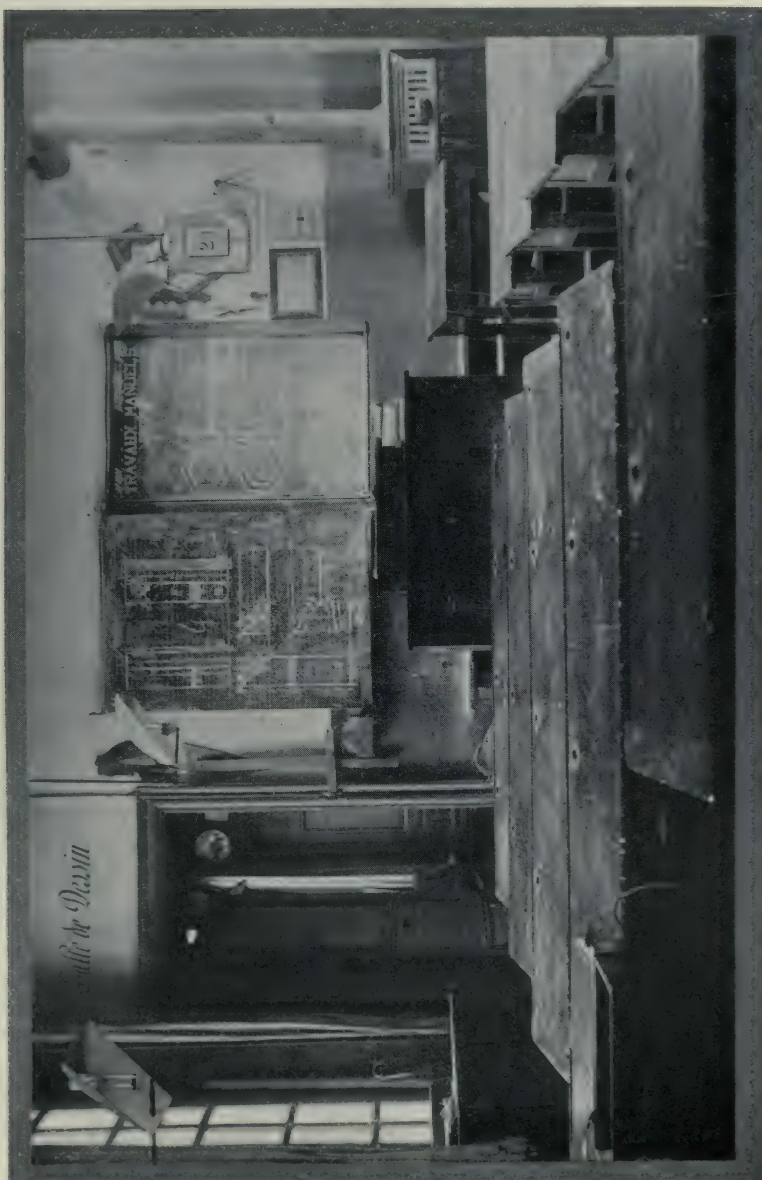


FIG. 89. CLASSROOM IN THE SALICIS SCHOOL.

The school is a special elementary school for boys. It is chiefly for those who wish to become mechanics, and the principal told me that most of them do become mechanics. They enter at the age of twelve or thirteen and remain three years. The morning hours, from eight to eleven-thirty, are given to the ordinary academic subjects of the elementary school, and the afternoon hours, from one to five, to shopwork and drawing. In this connection it may be stated that this division of time does not refer to any other elementary school in Paris. In the amount of time devoted to handwork and in general organization the Salicis School is independent, tho the time given up to the other subjects and the work accomplished is the same as that fixed for other elementary schools.

During the first year all pupils do the same kinds of shopwork; they all pursue courses in woodwork, metalwork, and clay modeling. At the beginning of the second year most of them have decided which kind of work they prefer, or are adapted to, and choose one kind to follow thruout the remaining two years. Some, however, wait another year before deciding, and so continue the three kinds thruout the second year. By the beginning of the third year all have decided. The principal placed considerable emphasis on the value of this opportunity for choice. He said that under special circumstances a pupil is sometimes allowed to make this choice after six months, and to pursue the kind of work elected to the exclusion of all others during the remainder of his time in the school. This, however, is not encouraged by the principal and is done only on request from the parents.

The principal showed us books of sketches and notes made by pupils. These were mechanical sketches with working dimensions and the geometric problems upon which they were based. The course followed was the one in general use in the city of Paris, "*Le Travail Manuel a l'ecole primaire et le Dessin Geometrique,*" by A. Jully, inspector of manual training, and E. Rocheron, assistant inspector. (Published by Belin Freres, 1900.) The lines in the notebook sketches were inked in with an ordinary writing pen and writing ink. Sheets of drawings made from the sketches were shown, which also were inked in with the ordinary pen and writing ink. As a rule, this work was well done. The pupils had learned to do the work neatly and in accordance with the conventions of mechanical drawing. The objects were made in the shop after the drawings had been completed.

In the room next to the office, Fig. 89, we saw pupils at work drawing in their note-books from sketches on the blackboard. This seemed to be the general method pursued in this department of work.

In the next room was the equipment for modeling in clay. This was provided ten years ago and was therefore quite modern when compared with the equipment in most of the other departments of the school. The diagram shown in Fig. 90, made from a hasty sketch, suggests the end view of one of the modeling stands. These were seven or eight feet long, and seemed to provide space for four pupils to work on a side. The feature of the design that interested me most was the drop-shelf which could be used either as easel or table. The height of this shelf was such as to be convenient when the pupil stands at his work. The model or drawing from which the pupil works may be placed on a rack just above the drop-shelf. Unfinished work, with damp cloths over it, was kept on a shelf beneath the drop-shelf. Finished work was kept in a cabinet. There were many plaster casts on the walls of the room, but they had not been in use very much lately, so we were told, because the teacher preferred to give the work from a drawing or blackboard sketch. I saw such a sketch, showing the front and sectional views of a petal for a rosette. From the standpoint of plastic art much of the modeling work in the cabinets was quite inferior in character—indeed very disappointing, but the explanation was easy to find. Laurel sprays, interlacing ornament, and the like were produced by cutting the individual forms out of flat sheets of clay, as a cook cuts out pastry, and then shaping them and putting them together as the art smith welds together petals, leaves and branches to produce a spray of roses. The principal's claim for this type of work was that it made the boys think more than does modeling direct from the cast. To me it was clay forging instead of clay modeling.

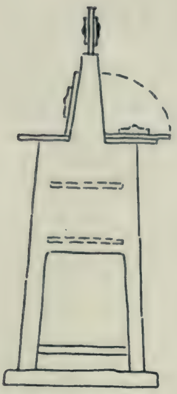


FIG. 90. END OF MODELING TABLE.

We descended the stairway and crossed the courtyard to the shop building, Fig. 91, the first manual training building in France. Here on the exterior was a bust and tablet placed there in honor of M. Salicis, under whose direction the building was constructed and equipped, and whose name the school bears. Work was started in this shop in 1873, from which time dates its present equipment. Any manual training teacher who knows even a small portion of the history of this building and the influence that has gone out from it, can hardly pass its threshold without a feeling of reverence. And this is heightened if he recalls

the fact that it antedates the educational sloyd work of Salomon in Sweden by one year, sloyd in Norway by six years, the work of Mikkelsen in Denmark by ten years, the establishment of the manual training shop

FIG. 91. SHOP BUILDING OF SALICIS SCHOOL, PARIS.

by Schenkendorf in Germany by eleven years, Professor Ripper's shop for grammar school boys in Sheffield, England, by seven years, and the opening of the St. Louis Manual Training School by our own Dr. Woodward by seven years. It is truly a historic building and its equipment has been unmolested except for slight repairs made necessary by constant use during these thirty-six years.

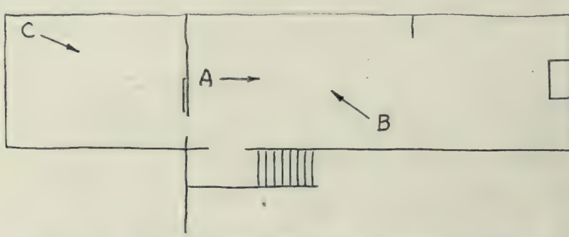


FIG. 92. PLAN OF WORKSHOP, SALICIS SCHOOL, PARIS.

Fig. 92 roughly suggests the general proportions and the main divisions of the space. Fig. 93 gives a general view of the workshop taken from the point A in the diagram. One recognizes at once the sub-

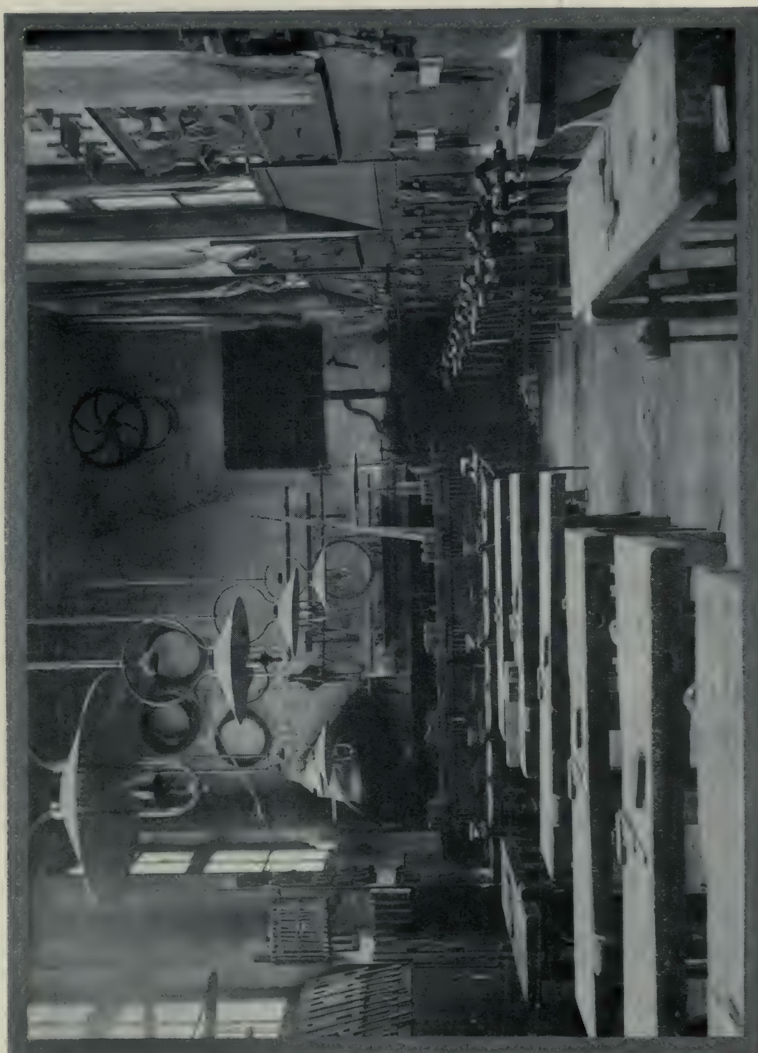


FIG. 93. WORKSHOP, SALICIS SCHOOL, PARIS.

FIG. 94. TOOL RACKS, SALICIS SCHOOL, PARIS.

stantial character of the benches and vises, their arrangement with reference to convenience in working, and the large forge with great leather bellows at the end of the room. The arrangement, too, of the metal-working tools is made clear in this illustration. For each boy there were provided six files in assorted shapes and sizes, two hammers, one hand vise and dividers. For general use there are taps, dies, die wrenches, tongs, and a hand-power drill press. There may have been other tools, but I was given to understand that there were not. The arrangement of the woodworking tools is shown in Fig. 94, which was taken from the point B in the diagram, Fig. 92. On the desk near the lower left-hand corner of the picture are several finished exercise pieces which are fairly typical of the earlier exercises in the course in woodworking.

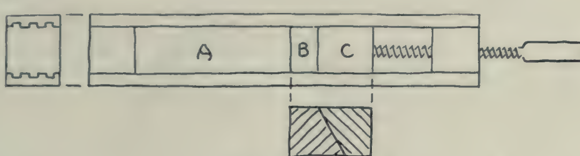


FIG. 95. CLAMP.

I was much interested in two devices in the shop which were used for holding work, especially while planing. One was a clamp, of which I made a memory sketch, Fig. 95, soon after leaving the school. The pieces B and C slide in grooves with the screw pressing against C. A piece of work may be held in place in the opening A by driving the block B against it by turning the screw forward. This piece may be the end of a board projecting but a trifle beyond the face of the clamp. By putting the clamp in the vise attached to the bench it is possible to plane the end of the board without fear of breaking off its far corner. It is evident that the clamp has other uses also. A section thru B and C reveals the fact that the two pieces rest against each other at an angle of sixty degrees (or it might have been forty-five). By sliding the block B to the left end of the space A, it becomes possible to clamp a piece between B and C at an angle of sixty degrees with the face of the clamp. Another device which was in the nature of a shooting-board with a vertical piece below to fasten in a vise, was evidently intended to accomplish a similar result in certain kinds of work.

A view of the classroom for drawing taken at the point C, Fig. 92, is shown in Fig. 96. This illustration also shows the location of the

FIG. 96. CLASSROOM FOR DRAWING, SALICIS SCHOOL, PARIS.

grindstone and the glue-heater in the shop. The drawing room interested me because of the simplicity of the equipment. The students sat on iron-legged stools and rested their drawing-boards on a railing made of iron pipe, and their feet on another iron railing. Their pencils or

FIG. 97. MANUAL TRAINING SHOP, PUBLIC SCHOOL, RUE ST. MAUR, PARIS.

other tools could be kept in the clumsy wooden troughs attached to the iron uprights supporting the rail.

An interesting feature of this historic building was the outside door which presented a most formidable appearance, owing to its heavy wrought iron lock and very large key.

TWO TYPICAL ELEMENTARY SCHOOLS.

The next morning we went to the public school on Rue Saint Maur, where we met the principal, I. Azais, who conducted us thru the entire building and gave us an opportunity to see work in such classes as were in session.

At this school the manual training shop was in a corner of the playground, Fig. 97, behind the main school building. The interior was in many respects similar to that at the Salicis School. Fig. 98 shows one end of the shop, in the center of which stands the genial principal

FIG. 98. INTERIOR OF WORKSHOP, PUBLIC SCHOOL, RUE ST. MAUR, PARIS.

of the school, who was kind enough to allow us to include him in the picture.

The principal gave us many facts concerning the organization of the work in drawing and manual training in the city. The geometric or mechanical drawing which is such a fundamental factor in the manual training work of the elementary schools of Paris, is taught by the regular classroom teacher who must first pass an examination in both drawing and manual training. He receives his instruction from the inspectors of manual training who meet classes of teachers on Thursdays. Each teacher who passes this examination has thirty dollars a year added to his salary. These classroom teachers also give the theoretical instruction connected with the manual training, but the actual tool handling is taught by special artisan assistants who have passed an examination in geometry, drawing and handwork, and who go from school to school. The assistants who teach the woodworking do not teach the metalwork, tho in some of the older schools both kinds of work are done in the same shop, but at opposite ends, as seen in Fig. 98. It is therefore apparent that in Paris there is a dual system of teachers—classroom teachers to give the theory, and artisans to teach the practice, or the actual handwork. The time given to the handwork is two hours a week. The drawing and theoretical instruction occupies another hour. All this work is obligatory. In 1900 there were one hundred and thirty-three woodworking shops and forty-three metalworking shops in the city.

The freehand drawing of the three upper grades is taught by special teachers who come to the school three days during the week. The modeling is also taught by a special teacher who comes once a week for two and one-half hours. The modeling equipment at Rue Saint Maur was the same as that seen at the Salicis School. The equipment for freehand drawing also was similar to that previously seen, but the seats were arranged in arcs of circles instead of straight lines.

On the following day I visited the public school on Rue Baudelaire, the most recently constructed school building of any considerable importance in Paris. It was really three schools in one—a *maternelle,* a girls' school, and a boys' school. In the *maternelle* was a large rectangular room for receiving the young pupils and giving them their breakfast; children as young as three years of age are admitted to this school. At the end of this room nearest the entrance were set washbasins with tile behind and below. Tiny settees were furnished for the children to sit upon, and on the walls around the room were excellent mural decorations intended to appeal to the children. They represented

the air by means of kites, a windmill, and a balloon; the fire, both cooking and destroying property; the water by ships and the sea; etc.—in short, the great facts and forces of nature. We visited a classroom in which were about fifty of the little children under the charge of a teacher. They were seated on the stiff, rigid benches provided in French schools, two pupils to a bench, and in front of them were desks, the tops of which were laid out in small squares to assist in the work of instruction. The perfect quiet and order of this room was a rather unpleasant surprise to me. I did not stay long enough to understand the entire system of the school, but somehow I would have preferred to see the children at work or at play in that beautiful large room where they had been left early in the morning by their nurses. I missed the kindergarten circle, the tiny chairs and the natural disorder of children so young.

In the girls' department we saw a cooking room that interested me. Its equipment consisted of (a) a large coal range, (b) a small gas stove on a tile or metal table, (c) a gas roasting stove in the corner with a hood over it, (d) a table about eight feet long in the middle of the room, (e) a short heavy table, and (f) a variety of pans, dishes, etc. Ten girls worked in the room at one time, but there were no two dishes or pieces of equipment alike—no individual outfits. The ten girls are treated as a family group, different work being assigned to each. The class was taught by a practical cook—not a trained teacher—who made no effort to teach the science of the subject. This, however, was taught to some extent as a separate subject by the classroom teacher or by the inspector of cooking. The head teacher in the girls' department told us that in the future they expect to have the cooking teachers themselves know and teach some of the science as well as the art of cooking.

We were conducted thru the boys' department by the principal of the school, M. Garrier. This school was so large that four shops were provided, two for wood and two for metal. One of each was in the low building at the end of the court shown in Fig. 99. The metal-working shop in the half-basement room was not well lighted, but the woodworking shop was most satisfactory in this respect. A modeling room, on the top floor, was well lighted and well equipped. I was especially interested in the system of lighting for evening classes. A light was provided for each model and another for each piece of clay being worked. These lights were incandescent gas lights, with big green hoods over them to keep the light within the required space, and to throw a strong shadow in the desired direction. The freehand drawing room, also, was equipped with lights for evening class work. The

seats were arranged in two theater-like groups with iron railings for board rests in front of the seats. The models were placed at the center of opposite ends of the room, so that the two groups of students were back to back. The mechanical drawing room would accommodate eighty

FIG. 99. MANUAL TRAINING SHOP, PUBLIC SCHOOL, RUE BAUDELAIRE, PARIS.

pupils at long, wide tables, pupils working on both sides. Over the center of each table was a row of the large hooded gas burners. This school is an important center for evening work, and on this account is better equipped for day work than many of the other schools.

One of the pleasantest mornings I spent in Paris was in company with Professor E. J. Lake of the University of Illinois, when we met by appointment Louis Guébin, chief inspector of drawing in the public schools. His exhibit shown in London the previous summer had just returned and he went thru it with us, mount by mount, explaining the entire course from the *maternelle* to the evening continuation school—from story illustration to mechanical perspective. I was particularly interested in the excellence of the work done by children twelve and thirteen years of age—just the place where our American work in drawing is often the weakest. One of the reasons for this strength in

FIG. 100. SECTION OF EXHIBIT OF MANUAL TRAINING WORK DONE IN PARIS ELEMENTARY SCHOOLS.

the Paris work at this point is that pupils of eleven or twelve years begin to receive instruction under a special teacher. Another reason is found in the fact that these teachers insist on careful studies from casts and from objects beautiful in form and in color. These studies are not black-and-white silhouettes and crude splashes of color, but they are serious efforts to represent the natural beauty of the things drawn.

Thru M. Guébin I gained permission to photograph the large board of manual training work sent by the Paris elementary schools to the Franco-British Exposition. The lighting of the room made it impossible for me to get a satisfactory picture of the whole board, or even half of it. Fig. 100 shows a small section of it and gives several characteristic examples of manual training models in both wood and iron, tho it does not show the preliminary exercise pieces which constitute by far the largest part of the work in the scheme in use in the Paris schools.

MUNICIPAL TRADE SCHOOLS.

The first of the higher schools I visited was *École Estienne,* the municipal school for teaching the arts and industries connected with book-making. The course in this school covers four years. Boys may enter at thirteen years of age. The school hours are from eight to six o'clock. The mornings are devoted to academic subjects which are modified somewhat with special reference to the needs of the book-making trades. The afternoons are given up entirely to practical work. Each pupil selects a department and continues to do his afternoon work in that department until he completes the course. He then goes out as a full-fledged workman in the trade represented by that department. There are two hundred pupils in the school, eighty being taken in each year. I saw the students at work in bookbinding, gilding, type-making, stereotyping, and electrotyping, composing room, press room, lithography, linotype work, wood engraving, zinc etching, copper-plate engraving, and printing from etched plates. Much of the work being done showed a high degree of practical and artistic skill.

Another afternoon I spent at the Germain Pilon School of design and industrial modeling. Boys enter this school by competitive examination at the age of fourteen, or thirteen if they have passed the elementary school examinations, and pursue a three-years' course. Only about one-sixth of the applicants gain admission. I saw the three classes in the school at work. The first-year students were doing work in geometric and projection drawing. They were seated in a large theater, and each

student was working on a drawing-board, one end of which rested on the fence or framework in front of him and the other end on his knees. The second-year students were at work at large tables. They were working problems in mechanical perspective, with shades and shadows washed in with water color. Great freedom was allowed in the coloring, but the problem was given in definite form by means of data and a blackboard drawing made by the teacher. This work was done in excellent spirit and with marked skill. It was evident that this school considers good mechanical work in orthographic projection, perspective, and theoretical shading and shadows just as essential a part of adequate preparation for work in design as freehand drawing from the antique and life, water color painting, and modeling. The third-year students were, for the most part, at work on original designs.

To the manual training teacher, *École Diderot,* the municipal school for the building and machine trades, is of special interest. This school of apprenticeship was founded in 1873. Students are admitted by examination; they must be graduates of the elementary schools, and not less than thirteen nor more than seventeen years of age. Tho we reached the school late in the afternoon we were shown thru all the shops. We saw students at work in (a) carpentry, (b) pattern-making, (c) plumbing, (d) blacksmithing, (e) coppersmithing, (f) locksmithing, (g) electrical construction, (h) machine construction, and (i) the making of instruments of precision. The work being done in all these departments seemed to be of high grade, but I was specially interested in the artistic character of the beaten lead work in the plumbing department, the heavy forging, the beaten work in copper and iron, and the construction of instruments of precision. The museum contained a great variety of excellent work that had been done by the pupils.

I went with my permit to *École Boulle,* the municipal school for the furniture trades, but was not admitted because visitors were welcomed on one day of the week only, and not on the day I presented my credentials.

THE TRAINING OF TEACHERS.

After visiting the three elementary schools and the three trade schools above mentioned, I was especially desirous of learning more about the training of teachers of manual training. Having read of the normal school at St. Cloud, I went there one morning, only to find that my credentials would not admit me to the classrooms. However, the principal of the school assured me that St. Cloud was not the school I should

visit, for there the manual training instruction occupied only three hours a week, while at Chalon-sur-Marne five hours a day was given to shopwork. He told me that the St. Cloud school did not train teachers of handwork, but merely those who teach the theory of the work while giving most of their attention to mathematics or science or some other academic subject. So we returned to Paris and secured from the Department of Commerce and Industry the desired permit.

The following morning we took the train for Chalon-sur-Marne, passing through the famous Champagne district. The journey was a very pleasant one, as the cars were comfortable and the sun was shining on the fields and the groups of houses along the way. To an American it seems strange to find that farmers, instead of living on their farms, all live in little villages and go out to cultivate the soil. I realized as never before where some of the French artists get the subjects for their charming landscapes. Simple pitch-roofed buildings with gray walls and mossy red tile roofs were huddled about a larger and higher building of the same character used for a church. We passed village after village of this same type, and each seemed to possess a peculiar charm of its own.

On arriving at Chalon we went at once to the *École National d'Arts and Metiers*. The building is very interesting, with its central pavilion back of a spacious court, its gateway, its colonades and gardens. It was built in the time of Napoleon I, and was originally a school for training young gentlemen. It is over one hundred years old. While the building is not wholly suited to present needs, it serves very well for the three hundred students who live there. The course covers three years; one hundred pupils are selected each year by competitive examination. They come from all parts of France and are strong students, due to the fact that the school takes only one out of every five or six who enter the competition. It was evident that the students come to this school to work and that they do work while there. The standards are high and the amount of work accomplished is large. The daily program of hours is as follows:

Morning study, six to seven-thirty;
School, eight to nine-thirty;
Shopwork, nine-thirty to twelve;
School, one-thirty to three;
Shopwork, three to five thirty;
Evening study, six to eight.

From this it will be seen that five hours a day are given to shopwork. This is continued for three years. The school subjects were arranged as follows:

	First Year.	Second Year	Third Year
Monday	Mathematics	Study	Economic History
	Sketching	Drawing	Drawing
Tuesday.	Physics	Mathematics	Mechanics
	Drawing	Drawing	Sketching
Wednesday	Literature	Mathematics	Electricity
	Drawing	Drawing	Metallurgy
Thursday	Mathematics	Chemistry	Mechanics
	Drawing	Technology	Drawing
Friday	Mathematics	Mathematics	Electricity
	Drawing	Sketching	Drawing
Saturday	Physics	Geography	Mechanics
	Technology	Drawing	Drawing

The simplicity of this program is apparent. There are two school periods of one and one-half hours duration each day, and one of these is given to drawing, except for one day a week. The graduates of the school enter engineering and mechanical industries—often as foremen or draftsmen. Of the eighty graduates in 1908 forty passed an examination and were licensed by the state as mechanical engineers.

As I went from department to department under the guidance of the director of the school I found many things to interest me. For instances, all the text-books used in the school are prepared by the professors and printed on a lithograph press in the building. An expert lithographer is employed for this work. The fine illustrations thus placed before the students, especially the mechanical drawings, must, I am sure, be a factor in holding up a high standard of technique in the drawing work in the school. I examined the mechanical drawing work of the first and second years, spending some time with the students at work, and I am quite sure that in no other school have I ever seen such technical excellence combined with such uniformity of product. In lettering, for example, the uniformity of result thruout the class was truly remarkable.

In connection with the workshop is a drafting room where students —a few at a time—are detailed from the shops to work out machines of their own design—a motor, an engine, a special lathe, etc. To look after these students is a foreman draftsman or designer. We were taken thru this department and the shops by Professor Alfred Bonis, mechanical engineer and superintendent of shopwork. Among other drawings he

showed us a set of working drawings of a Reed engine-lathe which they had produced. These drawings as well as the others shown, were in many respects similar to what we would find in an American factory, but the lines were much finer and more attention was given to the technique of drafting.

FIG. 101. WORKSHOPS, NATIONAL SCHOOL, CHALON-SUR-MARNE.

Fig. 101 shows the front of the woodworking and machine workshops which are in a building constructed with a sawtooth roof, and therefore well lighted. Fig. 102 shows the interior of the woodworking shop. This is about forty by one hundred and twenty feet in size and is equipped for sixty students to work at one time. These are divided into two sections, one located at each end of the room, and each section is provided with a teacher and an assistant. The machine-shop adjoining is about one hundred and eighty by one hundred and twenty feet and is admirably equipped not only with small machine tools, but also with very large lathes, planers, boring-mills, drill-presses and the like, enabling the shop to construct heavy machinery. Indeed most of these machines were built in this shop. It was very significant to me that the students were building a group of six engine-lathes of more advanced design than could be purchased on the market. I was given to understand that this school, and possibly other similar ones, is leading the factories of France in the

FIG. 102. WOODWORKING SHOP, NATIONAL SCHOOL, CHALON-SUR-MARNE.

design and construction of machinery. Much of the experimental work and testing that is done in America by the machine builders is done in France in the national schools.

This school proved to be very interesting to me, but in one respect I was disappointed. I went there to learn about the training of teachers

FIG. 103. REQUIRED WORK IN WOOD, FIRST YEAR, IN NORMAL SCHOOL, AUTEUIL, PARIS.

of manual training, but found that the director of the school did not wish to admit that they trained teachers. He said, however, that there were eight students in the school who were preparing to teach shopwork; that the idea of taking them into the school was comparatively new, being only seven or eight years old; and that the work for these students had not been organized into a special course. Such students take two years of work in the regular classes with the other students, tho they may finish in one year if they can pass a satisfactory examination. Finishing in one year is possible because the shopwork of the first year consists of a preliminary course thru all the shops. In the second year students are allowed, but not required, to specialize in one of the shops. In the third year all are required to specialize in shopwork. Students entering with the expectation of becoming teachers have previously gained experience in teaching under the Department of Public Instruction, but on leaving most of them receive appointments under the Department of Commerce and Industry.

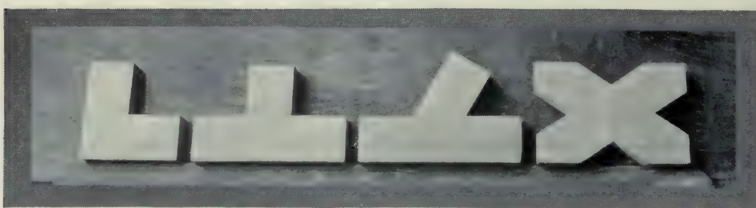


FIG. 104. REQUIRED WORK IN WOOD, SECOND YEAR, NORMAL SCHOOL, AUTEUIL, PARIS.

FIG. 105. REQUIRED WORK IN WOOD, THIRD YEAR, NORMAL SCHOOL, AUTEUIL, PARIS.

FIG. 106. REQUIRED WORK IN IRON, THREE YEARS, NORMAL SCHOOL, AUTEUIL, PARIS.

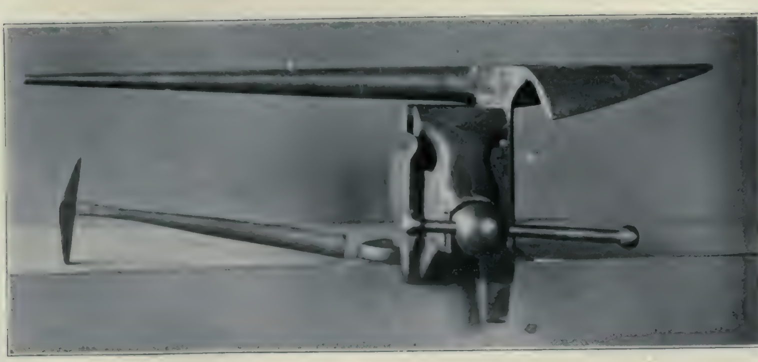
I returned to Paris that evening feeling that I had so far failed to discover the secret process of training teachers of manual training in France. The next day I made a final effort by visiting the normal school at Auteuil. Here I was fortunate in being turned over to an English-speaking student who explained the work very well. This school prepares teachers for service in the elementary schools of Paris. It gives courses in shopwork, but does not expect its graduates to teach the shopwork. They will teach drawing, will give instruction in science and mathematics, and will point out their relation to shopwork problems, but it is presupposed that they will always be assisted by an artisan who will teach the actual tool handling. The time devoted to shopwork by the students of this school is three hours a week for three years. As in the elementary schools, this time is divided equally between woodwork and ironwork. Fig. 103 shows the required work of the first year, consisting of five exercise pieces. Fig. 104 and Fig. 105 show the required work of the second and third years respectively—four joints the second year and three the third. Wood-turning is allowed as an elective which may be substituted for a part of this required work. Fig. 106 shows the required pieces of ironwork during the three years. In addition to these required exercise pieces in wood and iron, students made supplementary pieces. For the most part these are useful models of the same general type as those shown in Fig. 100. The equipment of the shop in this school was similar to that found in the shops belonging to the elementary schools, except that in this one there were foot-power lathes in addition to the bench tools for wood and iron.

Before leaving the school I asked my young guide if he had done work in practice teaching. He replied that he had just been doing such work. I asked him what he had taught. He replied that he taught arithmetic and geography. "Have you taught manual training?" I asked. He looked at me in surprise, as if he were not sure that he had caught my meaning, and asked: "Do you mean shopwork?" I indicated that such was my meaning. He immediately replied, and as if almost offended: "No, *I'm* a teacher." I hope this young man's attitude toward the shopwork was not typical, but I fear it was. While I found many fine things being done in the elementary schools and the normal school visited, I could not help feeling, as I left the city, that in some way progress in the development of manual training work in the elementary schools of Paris was being held back by not raising the position of the instructor in manual training to the level of that of the teacher of other subjects. If the shop assistant is merely an artisan he has no place in

the elementary school, even tho he might possibly serve some good purpose in a higher technical or trade school; if the shop assistant is really a teacher as well as an artisan, he should be recognized as such. The ideal system will develop educated artisan-teachers—teachers of manual training—and then place them on the same level with the teachers of science, even as the arts and the sciences go hand in hand in the development of modern civilization.

(*To be continued.*)

PROBLEM IN FORGE-SHOP AND WOODWORK, PROVIDENCE, RH. I., TECHNICAL HIGH SCHOOL.



NEW TOOLS REQUIRED.

METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, IV.[1]

ARTHUR F. PAYNE.

WE have now reached the end of the first distinct division in the series of problems which we have been following. Up to this point the problems have been what we might call flat-work and straight bending problems; that is, they have been flat pieces of metal cut to shape with a design etched or saw-pierced on them, and lightly beaten into form on a block of wood with the ball-pein hammer, such as the watch-fob, paper-knife, etc. Next came the straight bending problems, such as the blotter, book-end, hinge, etc.

The problems in the division which we are now beginning will teach in a simple progressive manner the construction of objects by seaming and riveting, and the process of raising a form or shape from flat metal by hammering.

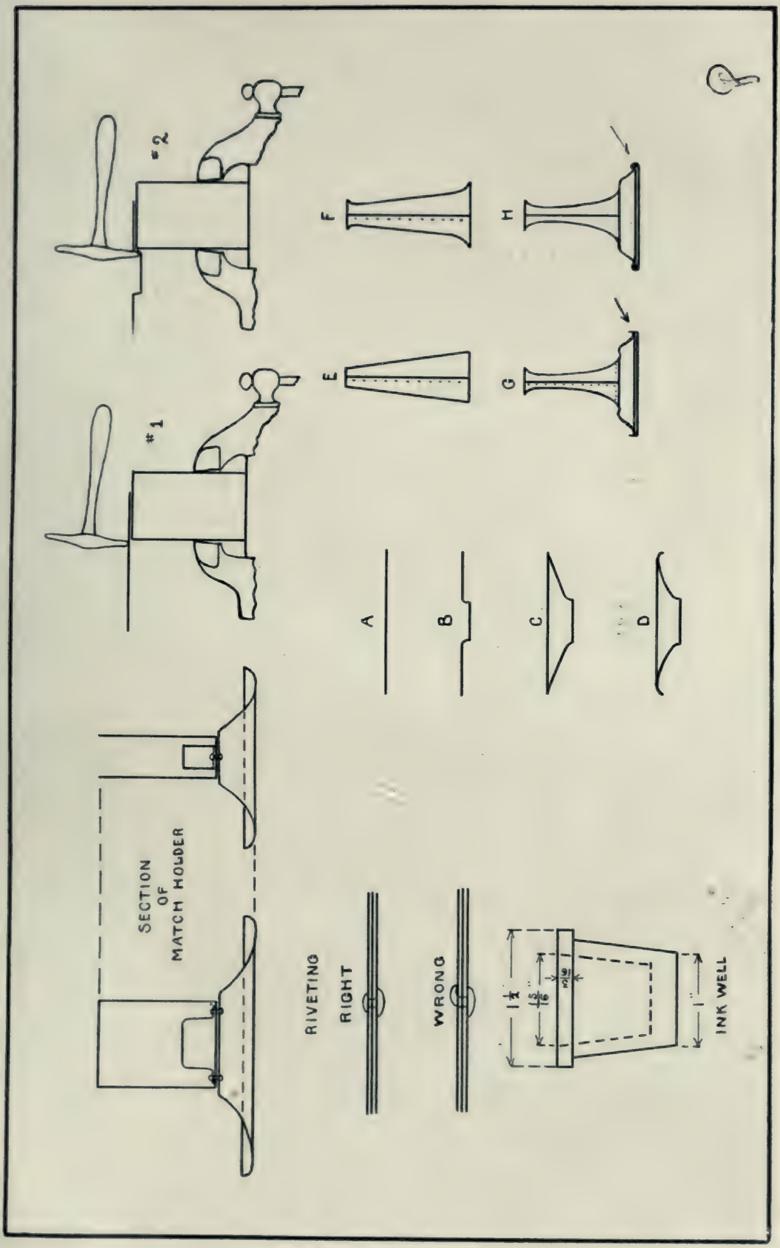
The new tools necessary are illustrated in the photograph and are as follows:

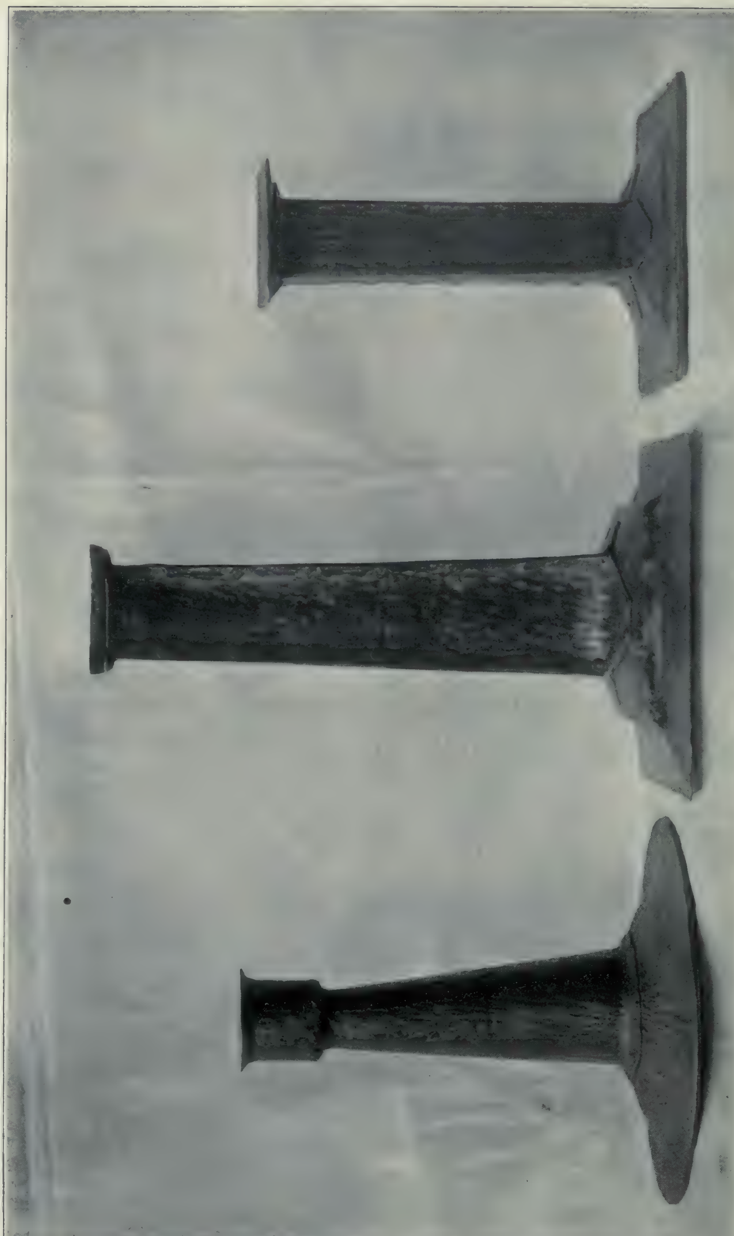
Iron vise, with jaws 3½″ wide, cost about	$3.80
No. 7293 neck hammer, cost about	1.25
Tinsmith's blow-horn stake, weight 14 pounds	3.50

The match-holder is a problem that involves the processes of bending, riveting, and raising. The base is raised or beaten into shape with the

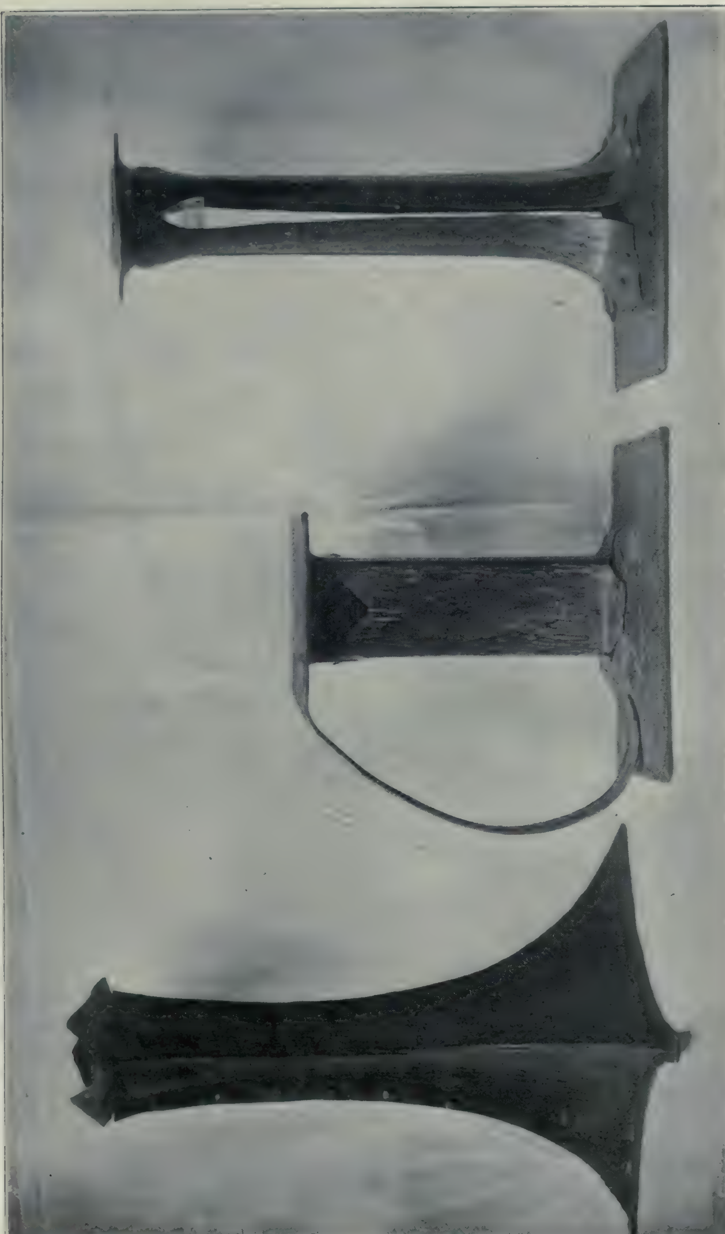
neck hammer, the holder is bent into form over a wooden block and riveted to the base. The detailed method of making the match-holder is as follows. Take a small match-box and measure the width, length and thickness; the box in the photograph was 1½″ wide, 2¼″ long, and ¾″ thick. A piece of copper is now cut out that will cover the two sides and one end. For a box of the above dimensions the piece of copper would be 5¼″ long and 1½″ wide. If a design is to be etched on the sides it is easier to do it at this time while the metal is flat. Fasten in the vise a piece of wood that is the same thickness as the match-box and with the hammer and mallet bend the copper over the wood and into shape, so that the box fits rather tight. Next cut a strip of copper 3¼″ long and ½″ wide and bend it with the pliers into shape as shown in the drawing; this is to slip inside of the box cover and raise the box so that the matches can be easily removed. To make the base, cut a rectangular piece of copper 4½″ long and 3½″ wide, 18 gage thick; mark in the middle the size of the raised part upon which the box-holder is to be riveted, and hammer it into shape with the neck hammer on a block of wood held in the vise. Care must be taken to strike the copper just off the edge of the block of wood as shown in No. 1 on the drawing, then the metal will give and bend as shown in No. 2. After the metal has been hammered and raised partly into shape it will get hard and stiff, and it will be necessary to "anneal" it. This may be done over the bunsen burner, or over a gas range, in a furnace, in fact in any place where there is heat enough to get it red hot. After it has been heated to a dull red heat it may be plunged into water while hot, or laid aside to cool, and it will be found to be soft and pliable again. It makes no difference which method is used to cool the metal as it is the heating that makes it soft. We may now continue hammering and raising it into shape, the progressive steps of the raising being shown as A, B, C. D, in the drawing. To bend up the edge, as shown in D, hammer with the flat side of the ball-pein hammer over the edge of the block of wood. To finish the base, hammer with the neck hammer in regular even strokes on the No. 157 lapping-stake illustrated in the June issue. We now have three pieces of copper

METAL-BOX HOLDER.


#1
#2
SECTION OF MATCH HOLDER
A
B
C
D
E
F
G
H
RIVETING
RIGHT
WRONG
INK WELL



CANDLE-STICKS.



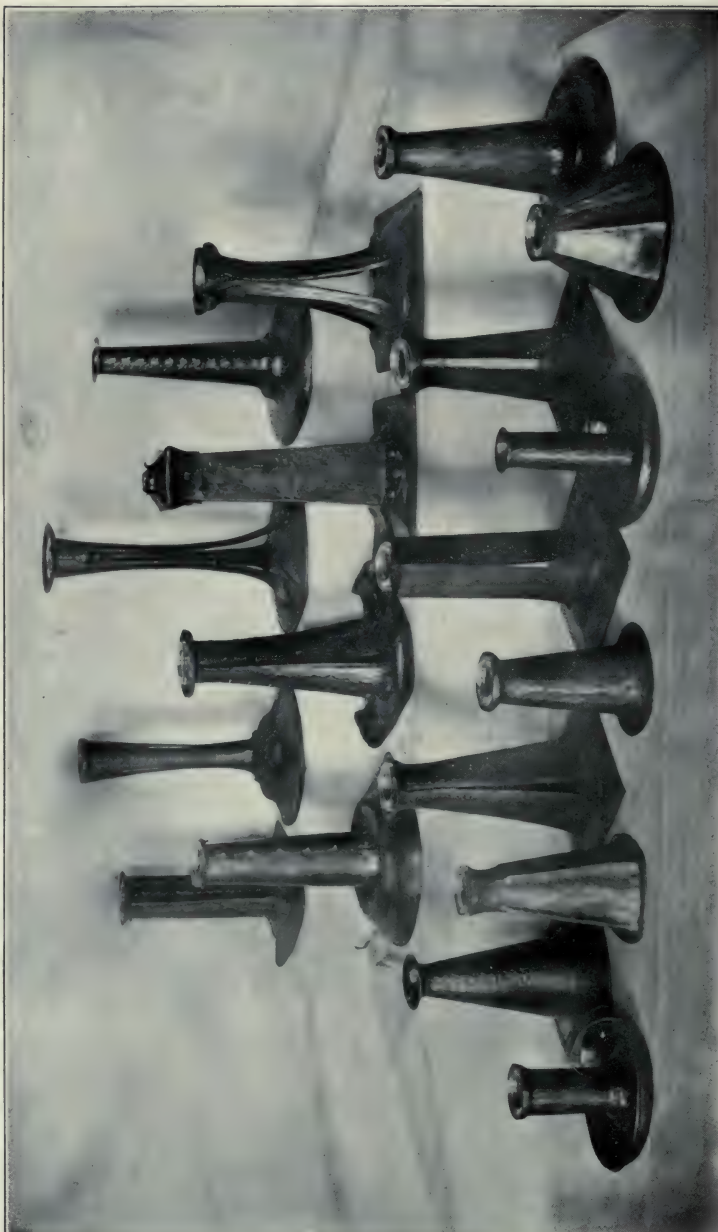
CANDLE-STICKS.

that are shaped and hammered ready to be riveted together. The rivets may be copper tacks cut off to the required length. Drill a hole the diameter of the tack in each end of the small piece that slips inside the box-cover, and placing that in its proper position inside the piece that holds the match-box, mark and drill the holes. Next place the box-holder in its proper position on the base, mark and drill the holes in the base. We now have in each of the three pieces two holes which will all correspond when in position. Care must be taken to have the head of the rivet rest on something solid; in this particular case the head of a large nail held in the vise will do. Let the point of the rivet come on the under side of the base and be careful to hammer the rivet as shown in the drawing. Color and finish in any of the previously described methods.

Our next problem, the candle-stick, may be constructed in many different ways, as may be seen by the photographs, but all are made up of the same number of parts; *e. g.,* base, pillar, socket, and sometimes a handle. Those made with a round base and pillar with a glass ink-well for the candle-holder are the easiest to make. The glass ink-well referred to is the ordinary desk ink-well in common use in the public schools and can be bought for forty cents a dozen. The dimensions of the well are given in the drawing.

To make the round candle-stick, make a paper pattern of the pillar, remembering that the top must be large enough to hold the ink-well, also to allow enough extra metal at the seam to lap over and rivet. Cut it out of the flat copper and with the prick punch mark the places for the rivets along one of the edges; then bend the copper around the blow horn stake, beating it with the mallet until the edges lap over. Drill the holes for the rivets, and rivet the end holes first. Always place the heads of the rivets inside the pillar, and rivet one at a time on the blow horn stake. If any difficulty is found in getting a rivet into its hole, place the rivet point upward on a flat file, insert in the tube and the rivet will easily pass into the hole. The pillar will now have straight sides and look something like E in the drawing. Bend out the top and bottom on the blow horn stake with the neck hammer until it looks like F in the drawing, being careful not to break any of the rivets. If a larger top is desired cut out a piece of metal and rivet on top as shown in the photographs. Now hammer smooth with the flat face of the ball-pein hammer and with the neck hammer, and it is ready for riveting to the base. The base is made by cutting out a circular piece the size wanted and beating into

LAMPS.



CANDLE-STICKS.

shape in a depression in a block of wood, hammering it smooth with the ball-pein hammer on the No. 153, H, smoothing-stake illustrated in the June issue. Wherever possible, avoid leaving the raw edge of the copper as it is likely to scratch and scrape anything it comes in contact with. For instance, if we should leave the edge of the base as it is now, it would scratch any table or piece of furniture it might be placed upon. It would also be liable to get bent out of shape. To avoid this we will lap the edge of the base up or down by exactly the same process that we did the book-ends. Then rivet the pillar to the base. If it is desired to make a better and more finished piece of work, the base may be made more solid and substantial by lapping another piece of flat copper on to the base instead of merely lapping the edge. This is done by cutting out another piece of copper $\frac{1}{4}$ of an inch larger in diameter than the base of the candle-stick, turning the edge of the flat piece over at right angles on the lapping-tool, and fitting the base into it, as shown at G in the drawing; then with the neck hammer carefully bend the edge over on to the base and hammer down smooth, as shown at H in the drawing. Color and finish by any of the previously described methods.

For a square candle-stick the process is similar except that the base is raised into shape in the same way as the match-holder base, and the pillar is shaped on a square piece of iron or steel.

Candle-sticks may be made without the use of the glass ink-well, by making the top smaller and filling the pillar nearly full of plaster of paris mixed with water. The plaster will support the candle and stop it from dropping down too far.

The two table electroliers shown in the photograph are a logical development of the candle-stick problem. The construction is substantially the same, the only difference being that the electroliers are larger, and arms are added to support the shade. These arms are made of round copper wire flattened at the end and riveted to the pillar.

In this and the preceding articles copper has been specified for the problems to save repetition of words, but brass may be used instead of copper in every case. The same instructions apply to both brass and copper except in coloring, which difference was explained in the April issue.

(*To be continued.*)

EDITORIAL

THE visit of Dr. Georg Kerschensteiner, Superintendent of Schools, Munich, Bavaria, to this country is an event of real importance to all those interested in the progress of industrial education in the United States. Since the publication in 1890 of Dr. Kerschensteiner's essay on the "Civic Education of German Youth," which received the prize offered by the Royal Academy of Erfurt, his name has been increasingly to the front in educational affairs in Germany. The leading idea brought forward in the essay is that from social, civic, and ethical points of view, vocational training of its growing youth is a provision necessary for the efficiency and well-being of the state.

Dr. Georg Kerschensteiner

Elected Superintendent of Schools of Munich in 1895, Dr. Kerschensteiner proceeded to put into realization his educational views, with the result that attendance upon the continuation schools was made compulsory for a period of four years, for all boys who do not continue in the regular schools beyond fourteen, and for three years for girls. Thru his untiring efforts forty-eight industrial continuation schools and twelve continuation schools with shops have been established, in which the boys receive eight or ten hours of instruction a week and the girls three hours. Instruction is free and is given before the hour of 7 p. m. These schools, consequently, represent the type that we in this country have begun to call "part-time schools." Boys generally give either two half days or one whole day out of the six regular working days to the schools. Employers are required by law to allow time for attendance upon these schools. In some trades the apprentice suffers no loss of wages, but in many cases no wages are paid for the day spent at school. Numerous shops, laboratories, and competent teachers have been provided by the state for these schools thru Dr. Kerschensteiner's energy. The practical shop or laboratory work forms a central feature in most of these schools and is the core about which much of the instruction is developed. The schools are governed by a Board of Directors composed of nine members. These stand in close relation with the employers, who furnish the funds for the materials used, and who are consulted regarding the course of instruction, recommending technical instructors, supervising the practical instruction, and interesting themselves generally for the welfare of the school. Every trade

school has its own school board, which is composed of the school committee, one member of the Board of Aldermen, and three employers of the particular trade taught in the school. They are entrusted with the administration of the school and more particularly with the oversight of the attendance. About 9,000 boys and 7,500 girls attend these compulsory continuation schools, and 3,600 girls attend the non-compulsory continuation schools. This in a city of 580,000 inhabitants—which is about the size of Boston!

Besides this remarkable development in practical continuation schools, which has made them for many years objects of study and interest to educators in all parts of the world, Dr. Kerschensteiner has effected many other signal developments in the Munich school system. Early in his superintendency he prevailed upon the municipality to extend compulsory attendance in the regular public school to eight years, covering the period from six to fourteen, notwithstanding that measure occasioned an increased outlay in school expenses of 250,000 marks. Domestic science, school gardens, and practical laboratory instruction in chemistry and physics, have been introduced into the schools under his direction, and the system of school play-grounds and play-ground games greatly extended.

The keynote of Dr. Kerschensteiner's attitude and efforts in the development of industrial education is cooperation between the employer and the public school system, or, to put it in another way, coordination between the training of the shop or factory on one hand and the school on the other. His point of view, which has received such emphatic endorsement in his home country, is that the school is an institution that can perform the office of instruction better than the shop, and that the best possible results in industrial training are possible only when these two agencies cooperate.

It would seem to be a fact that if industrial education is to have a broad and sound development in this country, we need above all things a general realization of this principle. There has been much talk in the past by schoolmen as to the sufficiency and superior advantages of training to be obtained in industrial schools as compared to commercial establishments, and much criticism of schoolmen by employers as impracticable and visionary. It is perhaps not too much to hope that Dr. Kerschensteiner's presentation of the organization and results of the Munich schools, may prove of material assistance in producing a greater unity in our efforts and in our point of view.

His itinerary includes addresses in Cincinnati, St. Louis, Chicago, Boston, New York, and Philadelphia. The National Society for the Promotion of Industrial Education invited Dr. Kerschensteiner to visit this country, and he spoke at the annual convention of that body in Boston November 18th. It is to be hoped that every reader of the Manual Training Magazine within reach of the Doctor's stopping points will, by the time this editorial appears, have had an opportunity to hear him. —C. R. RICHARDS.

Influence of the Manual Training Room It is difficult to estimate the influence of external appearances upon the mind of one who is, consciously or unconsciously, passing judgment upon worth. Of course it is not safe to say that outward conditions are necessarily the true index of character, and yet it must be admitted that they form a large, and usually a just, factor in the estimate of a man's relative value and probable degree of success. It is doubtful if the average industrial teacher fully appreciates this fact and it is certain that many do not at all.

The appearance of the manual training room is one of the most subtle of these influences. Almost invariably the visitor's first estimate of a teacher is expressed in terms of what has appealed to the eye in the appearance of the room. Disorder, untidiness, lack of system, slovenly workmanship on the part of both teacher and pupils invariably cause unfavorable comment, while the reverse of these conditions will just as certainly color favorably other shortcomings. The care and conduct of the manual training room is a problem that the teacher cannot afford to ignore. Conditions in the room should create an atmosphere that will influence the pupil, not only in immediate results in his work, but in relation to his home, in character building and in future success. Neatness, system, order, beauty, all are cardinal elements in successful manual arts work, and are possible, at least to a degree, even under the most adverse condition.

—W. E. ROBERTS.

The New Code in Pennsylvania The State of Pennsylvania, like Illinois, is going thru the process of changing its school code. An educational commission has been appointed to revise the law. This action affords an opportunity for giving full consideration to all the live educational problems of the day, prominent among which is the place which should be given to manual training, and the provision which should be made for vocational training. The time has evidently come when Penn-

sylvania teachers who have a clear vision of the place of these subjects in education should let themselves be heard.

The State Teachers' Association will hold a meeting in Harrisburg December 28-30 for the the purpose of bringing the proposed school code to the attention of the members of the state legislature. A rousing meeting is expected. In the meantime some of the leaders in the movement for more industrial education have been bringing facts to the attention of the public and especially to the attention of the Commission. At a meeting of the State Asscociation held in Erie last spring, Lewis W. Cruikshank of Philadelphia made a stirring address in which he reviewed the situation historically and pointed to present needs. Many other educators thruout the state have been heard on this same general subject. Perhaps no one, however, has been more persistently and intelligently active in this respect than Paul Kreuzpointner of Altoona, the chairman of the industrial education committee of the American Foundrymen's Association. By means of articles in the public press, conferences with educational committees and letters to officials, he has spread abroad facts concerning industrial education in Europe and the needs and possibilities of such education in America.

In one respect at least Mr. Kreuzpointner takes a position in advance of many of the advocates of vocational training. Instead of taking the extreme position of the manufacturer who would have public schools train operatives, he emphasizes the importance of fundamental general training for every child, and opposes all short cuts in education. He would, moreover, insist that the fundamental training be broad enough to include the elements of industry. This leads him to emphasize the conviction that in manual training is to be found a necessary foundation for trade and technical instruction. In a letter addressed to the president of the educational commission, Mr. Kreuzpointner says:

> I notice with regret the absence of recognition of the urgent needs of Pennsylvania's industries in not having manual training added to the course of the elementary and high schools. Since manual training has formed part of the regular curriculum of many of our elementary schools for some time, and is without doubt destined to do so in an increasing number of schools in the near future, this subject seems to have proven not only its adaptability to the courses of study pedagogically, but also its desirability of presence in the schoolroom from the intellectual and material necessities of the people and our industries. The extent of recognition manual training has been accorded by professional educators as a valuable addition and counter poise, as it were, to the academic studies seems to vouchsafe the feasibilitty of manual training as a prescribed subject in the elementary schools of the industrial state of Pennsylvania.

Whatsoever may be the organization, the nature and status of the coming industrial and trade school in our state and country, now so urgently demanded for the sake of being able to retain our industrial standing, this form of education will in its results, be superficial and ineffective to the degree as its pupils will be deficient in the necessary preparation in the schools below. It is a universal complaint now of teachers in shop schools and trade schools that valuable time has to be lost in teaching things which ought to have been taught below, just as college and normal school professors frequently complain of being obliged to do elementary or high school work. Manual training offers such preparation to industrial and specific trade education, and I dare say that, from my knowledge of the situation, our industries will be handicapped in the future if their urgent needs receive no recognition along industrial education lines. . .

While I agree with others that manual training has been disappointing as a help to our industries directly, nevertheless it has proved to have a mission, and will have an important mission in the future with the establishment of industrial and trade schools.

Minnesota's Progress. Anyone who wishes to know the spirit and progress of industrial education in the Central States should read the report of the state inspector of high schools in Minnesota for the year ending July 31, 1910. This report reveals a condition that is truly remarkable. It shows conclusively that at least one state has a thoroly organized and progressive high school system, and that, with reasonable state aid, the smaller high schools, even, may offer courses in manual training, domestic science and agriculture. The following figures, taken from Mr. Aiton's tables, tell their own story of rapid progress:

	1899-0	1904-5	1908-9	1909-10
Schools giving Manual Training.............	7	17	84	122
Students taking Manual Training.............	745	2,189	4,233	4,770

The growth in the work in mechanical drawing is not so rapid, but it is large—from 15 schools with 864 students to 73 schools with 3,866 students in the ten years. Cooking and sewing are recorded for the past two years only, the total number of students last year being 1,267 in cooking and 1,616 in sewing. The number taking agriculture last year was 1,331. Equally significant is the long column of expenditures. For manual training equipment in the 122 schools there was spent last year $48,438 out of a total equipment expenditure of $134,746. Moreover, last year was not the first year in which a large sum was expended on manual training equipment. In 1908-9 the amount was $48,227, and in 1906-7 it was $19,351. Hardly less interesting, and possibly more so, are the statistics of the ten agricultural high schools of the state, each of which employs an instructor in manual training, one in agriculture, and one in domestic science.

Concerning the agricultural schools, Mr. Aiton says: "A common-sense combination of academic and industrial work, the latter to include domestic science and agriculture, is the type of school that makes a hit with the public, and is the kind of school that will do the most good. Four hundred schools of this character should be established in this state as rapidly as local sentiment, equipment, and the supply of efficient instructors permit. Farming communities can be induced to share the expense of teaching shopwork, domestic science and agriculture in connection with other branches. This sort of school work appeals to the intelligent farmer." He also speaks of the great need of more trained teachers—especially those who can successfully teach such combinations of subjects as "science and agriculture, mathematics and manual training, history and sewing, Latin and cooking." He says that in the advanced graded schools and in small high schools, "the salvation of the standard subjects depends on their being taught in combination with utilitarian subjects, and this is the way they ought to be taught." Then follows a plea for a local source of supply for the needed teachers. The state trains physicians, lawyers, pharmacists, engineers, and scientific agriculturists; why not high school teachers? One hundred a year are needed—"young men of reading, breadth and culture, and at the same time able to dignify the labor of the accountant, of the shop, or the farm—young women conversant with letters, and at the same time inspired to teach our daughters that there is no more ladylike occupation than making a home."

ASSOCIATIONS

A little study of the Directory of Organizations, beginning on page vii of this issue, shows that a number of important educational meetings are on the calendar for the months of November and December. These all occur so late that it is impracticable to secure reports from them in time for this number, tho it is expected that several of the meetings will be reported in the February number.

A number of Associations appear to have discovered that one of the very best ways to accomplish things is thru efficient committees. It is instructive to note the extent to which associational effort is being directed thru this particular form of activity, and to note the results also. In response to the invitation in these pages in the October number the Editor has received several letters of inquiry and suggestion which point to further possibilities of usefulness. The Associations Department freely places its resources and facilities at the disposal of officers and committees.

The advance program of the fourth annual convention of the National Society for the Promotion of Industrial Education showed in detail the rich treat in store for those fortunate enough to be in Boston on November 17-19. Two sessions are given up to the problems of industrial education for girls: Thursday morning, "Demands and Opportunities for Girls in Trades and Stores," *Chairman,* Dr. David Snedden, Commissioner of Education, Massachusetts; Thursday afternoon, "Training of Teachers for Girls' Trade Schools," *Chairman,* Pres. Henry Lefavour, Simmons College. The sessions on Friday and Saturday dealt with various aspects of apprenticeship, part time, and evening schools, and the social meaning of industrial education. The principal address of the convention was on "Continuation Schools of Germany," by Dr. George Kerchensteiner, Superintendent of Schools, Munich, Bavaria. The speakers at the annual banquet were: F. A. Delano, President Wabash Railroad, Chicago; F. P. Fish, Chairman, State Board of Education, Boston; C. H. Winslow, American Federation of Labor, Washington, D. C.; Charles R. Richards, President of the National Society.

At the meeting of the Minnesota Educational Association, Saint Paul, November 3-5, considerable attention was given to the problems of industrial education. At the Manual Arts Section the following topics were discussed: "Possibilities of Manual Training in the Rural Schools;" "Practical Value of Mechanical Drawing;" and "Trade Education as a Function of the Public Schools." At the Domestic Science Round Table the topics were: "Educational Ideals in Domestic Art," and "The Art of Table Service." In the Industrial Section the general topic was "The Demands of Democracy Upon the Public Schools of Today." Two of the papers were: "Utilization of the

Present Organization and Equipment in Promoting Industrial Training," by Supt. A. D. Wilson, Minnesota Farmers' Institute," and "The Meaning of Industrial Education," by Pres. F. A. Cotton, State Normal School, LaCrosse.

The Manitoba Manual Training Tteachers' Association reports having had several profitable meetings. The following papers have been presented and discussed: "Summer Schools as a Means for Recreation," by R. B. Vaughn; "The Summer School as an Educational Influence," by S. T. Newton; "Wood Finishing," by H. Halmshaw; "Book Case Ends," by W. W. Pierce; and "Chair Construction," by C. L. Fultz.

The Indianapolis Manual Arts Association has given up its formal organization, altho meetings are still held at the call of the Principal of the Manual Training High School and the Director of Manual Training in the grade schools. Joint conferences are held from time to time to discuss matters of interest.

The Manual Training Section of the Pennsylvania Teachers' Association has not been very active in recent years, but efforts are now on foot to revive the work. There will be two sessions, instead of the usual one, at the annual meeting this year. It is expected that all the State Normal Schools will be represented, and that several strong committees will be set to work.

The Drawing and Manual Training Department of the Maine Teachers' Association held a session in connection with the State meeting at Bangor, October 27-28. Miss Mabel H. Drake, Westbrook, presented a paper on "Picture Study in the Public Schools;" "Drawing for Grade Teachers," with blackboard illustrations, was discussed by Miss Agnes C. Burr, State Normal School, Gorham; and B. T. Newman, Fryeburg Academy spoke on "The Relation of Art to Manual Training."

This Missouri Association of Applied Arts and Sciences has arranged to hold an informal meeting at St. Joseph at the time of the State Teachers' gathering in December. The plans include a dinner with Professor James Monaghan as guest of honor. The Association has a committee at work investigating the "Present Status of the Teaching of the Arts in the Schools of Missouri."

The Ohio Art and Manual Training Teachers' Association met at Dayton, Friday, November 11th, in connection with the meeting of the Central Ohio Teachers' Association. Among the topics discussed were: "Posters as an Educational Problem in Art," by W. D. Campbell, Columbus; "Art in the Grades," by Susan I. Odlin, Dayton; "Shop Economics," by W. E. Painter, Newark; "Constructional Design," by T. K. Lewis, Ohio State University; "Location of

Large Pieces of Equipment in School Kitchens and Material for the Table Tops," by Misses Wardell, Columbus, and Uhlrick, Cincinnati; "The Use of Drafting in High School Work," by Lena Bishop, Cleveland Technical High School.

The members of the Boston Manual Training Club were very pleasantly entertained by their friends at Worcester, who acted the part of hosts on Saturday, November 5th. Among the good things enjoyed were the opportunity to "see steel made by the open hearth process, and machine parts accurately finished by rapid grinding. One of the latest phases of industrial education at the Worcester School of Trades, and the Worcester Polytechnic Institute famous for its 'actual business' Washburn shops." The trip included a luncheon together at noon, and was thoroly enjoyed by all.

The Oklahoma Manual Training and Drawing Association reports a rapidly increasing membership. The officers are working up a directory of manual training and drawing teachers in the State.

Teachers of manual training interested in the problems of domestic science and domestic art will do well to attend the Saint Louis meeting of the Home Economics Association, December 27-30. Full details, with copy of program, may be obtained by addressing the secretary—see Directory of Organizations on another page.

SHOP PROBLEMS

GEORGE A. SEATON, Editor.

INDIAN CLUB.

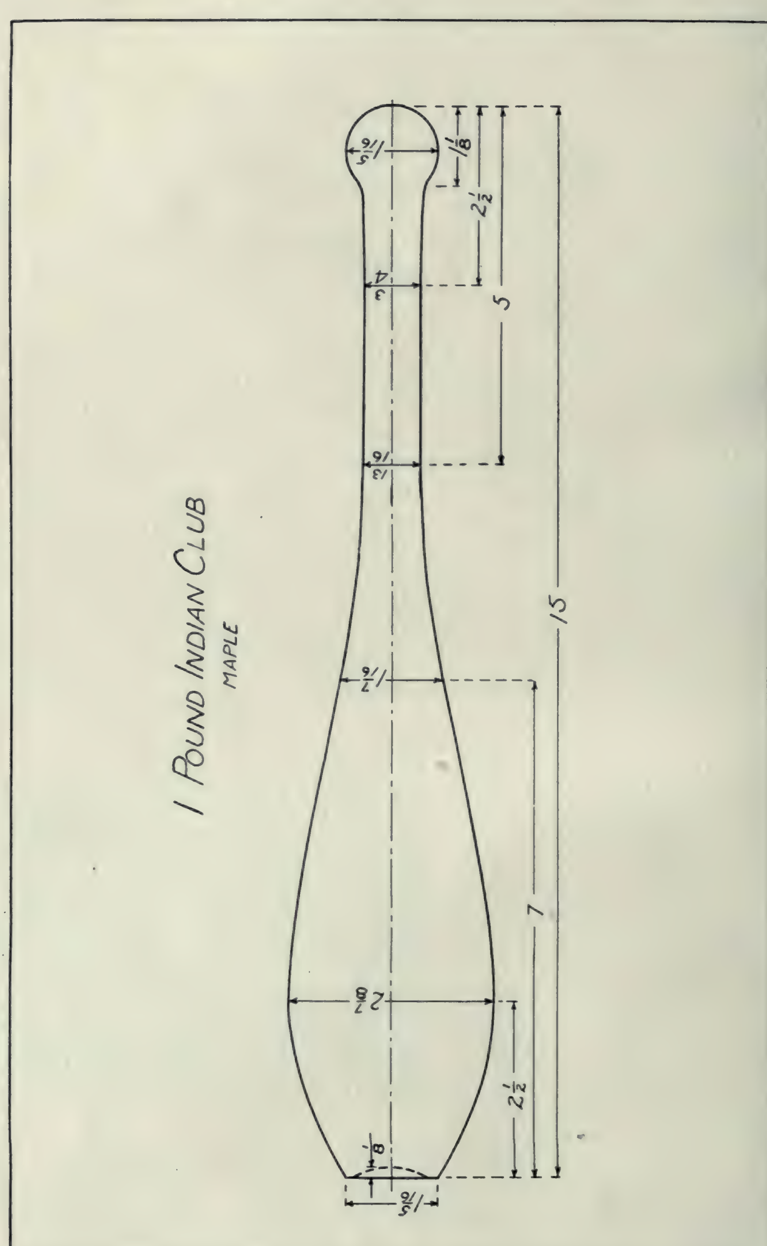
The Indian club has long been a favorite problem of the wood turner, as is evidenced by the designs which are in use at present. In most of our modern gymnasiums a slow-swinging club is in use and such is the one shown in the drawing. This slowness in swinging is brought about by putting the weight as low as possible in the club. In the making of a pair of clubs it is suggested that the first one be made as near like the drawing as possible but a trifle large. Then by careful trimming here and there it is brought pretty close to a pound when tested by weight. Of course, until the club is entirely completed some allowance will have to be made for the weight of the waste stock at each end. When the first club is finished, it should serve as the model for the second.

INK-BOTTLE HOLDER.

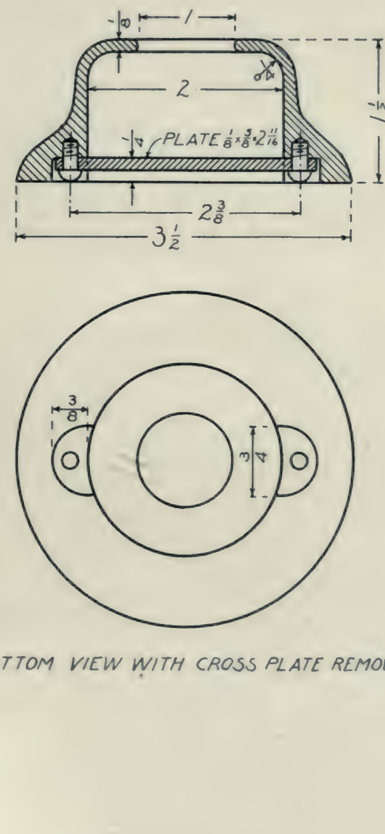
This problem is intended for work in pattern-making, tho by using a wood of good weight a very serviceable holder may be obtained for the ordinary bottle of drawing ink. The bottle is to be put in position from the under side and then held there by the rounded end crossbar which is screwed in place underneath the bottle. If the casting is made of brass it can be finished on the ordinary wood lathe by use of files and emery cloth. Of course, it will cost considerably more in brass than in iron. If the casting is made at the school without elaborate equipment some such material as pewter can be used successfully.

DUTCH CLOCK.

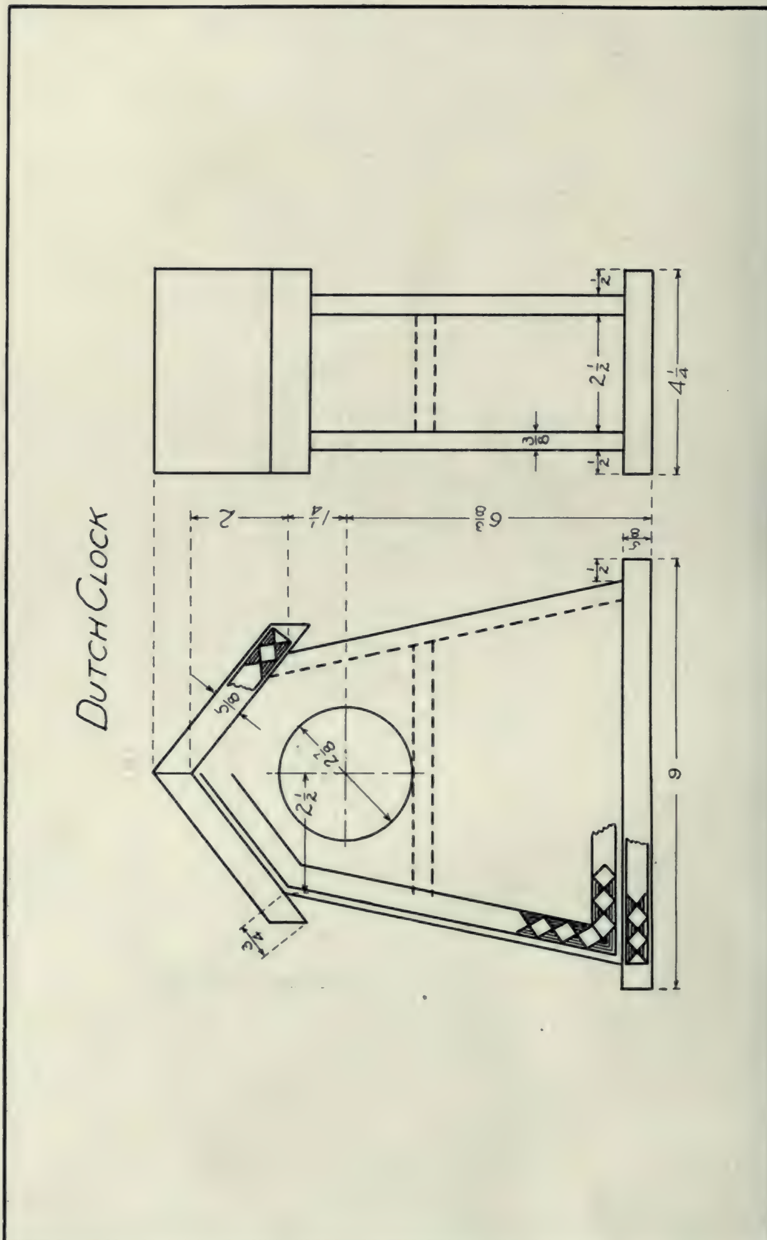
In the Maine School for the Deaf at Portland they are making some clock cases which are very popular. Herbert L. Johnson has supplied the design from which the drawings are made. In the construction he suggests that the front and back should be made first, the sides second, and the roof and bottom third. The measurements for the front and back are all to be laid off from a vertical center line. The placing of the shelf as well as the opening allowed in the front will depend upon the clock chosen. A door must be provided in the back of the case in order that the clock may be accessible. The drawing shows how a border of chip carving may be applied, while the space below the clock face affords a place for suitable relief carving.


1 Pound Indian Club
Maple
5
15
7

INK BOTTLE HOLDER



BOTTOM VIEW WITH CROSS PLATE REMOVED


DUTCH CLOCK
2
1/4
6 3/8
5/8
2 1/2
2 5/8
3/4
9
1/2
3/8
4 1/4

HYGROSCOPE.

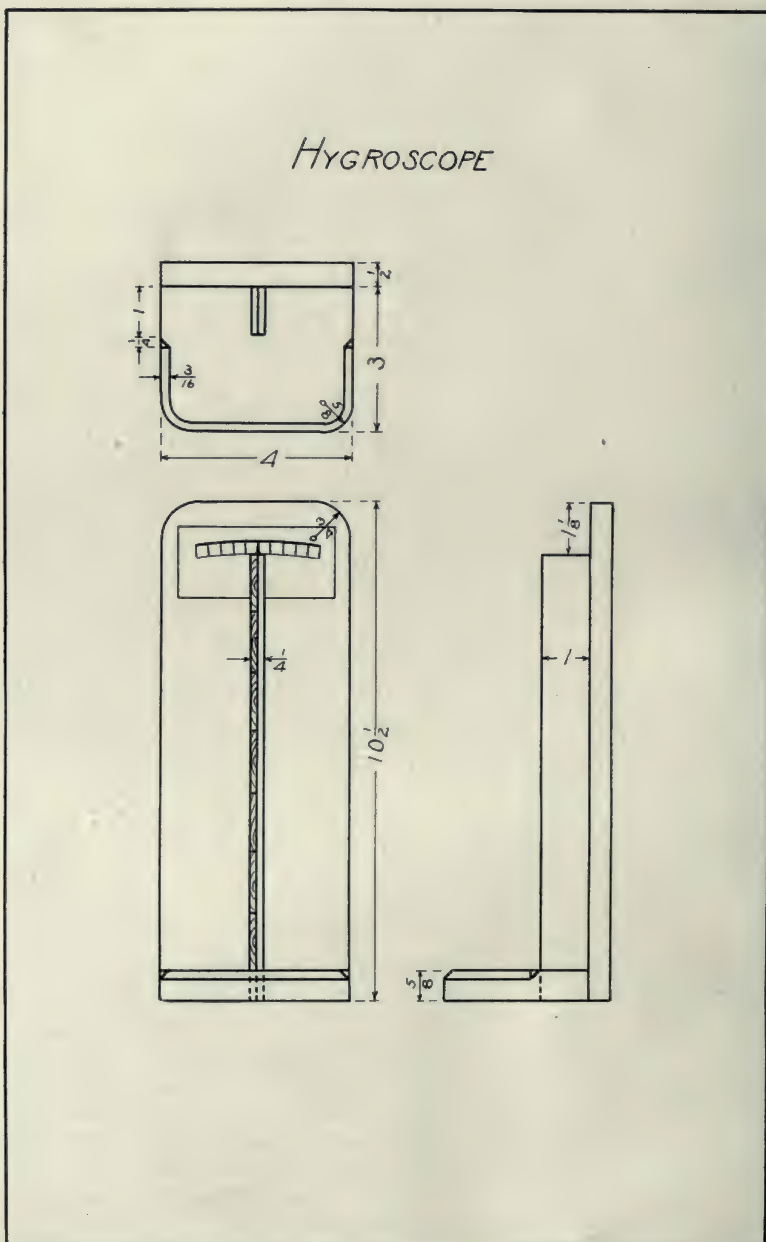
The drawings for the hygroscope are taken from blue prints in use at Bradley Polytechnic Institute, Peoria. Its construction is comparatively simple, as it is made up of a base, a back, and a vertical pointer, secured in the base and free to move in front of the back. This pointer is made up of two layers securely glued together. In the layer at the right the grain of the wood runs parallel with the length of the pointer, but in other half of the pointer the grain is placed at right angles to the length. As can readily be understood, the varying amount of moisture in the air will cause the pointer to curve to the right or left in front of the paper scale that may be affixed to the back. If a pin be driven in the end of the pointer and its head filed off, it will be possible to secure more accurate readings. The instrument is placed beneath a bell glass or other tight container with several pieces of wet blotting paper near, but not touching the pointer and allowed to remain for six or eight hours. When it is taken out, a dot can be made on the paper scale at the end of the pointer which will indicate the point of saturation. After drying in the open air, the instrument is now replaced under a bell glass with a dish of calcium chloride and left for five or six hours. The point now marked by the pin will indicate the maximum dryness of the air and can be designated as zero. If the point of saturation be called 100, the space between it and the last point obtained can be divided into ten equal spaces, each one of which will represent ten degrees, which divisions can also be marked if desired.

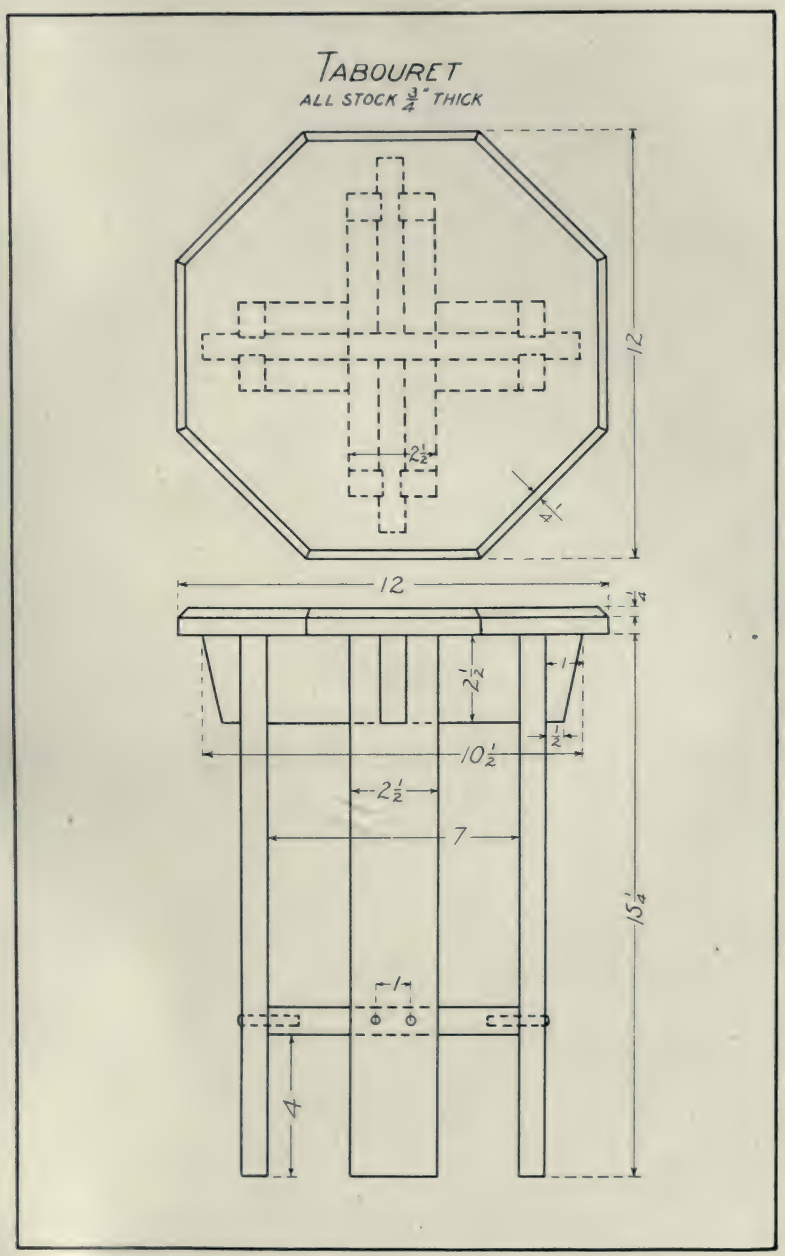
TABOURET.

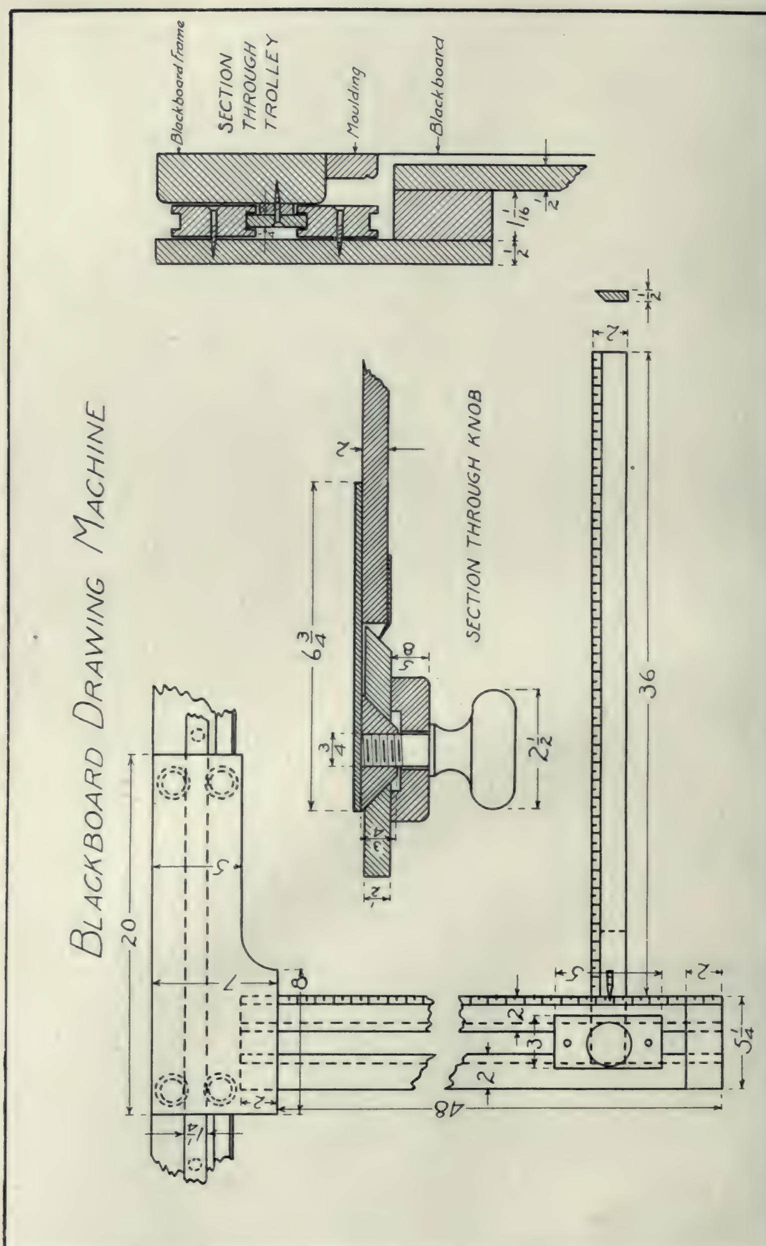
The eighth grade classes of East Cleveland have enjoyed making the eight-sided tabouret shown in this number. All stock is finished ¾ inch thick and the legs and four cross-bars are 2½ inches wide. The upper cross-bars are grooved to a depth of ⅛ inch to accommodate the legs which are glued into place. The lower cross-bars are to be clamped into position for boring the holes for the $\frac{5}{16}$-inch dowel pins which are allowed to project with a rounded end. The top is to be held in place by screws thru the cross-bars or thru cleats attached to the cross-bars.

BLACKBOARD DRAWING MACHINE.

The drawing of this machine is given for the benefit of the teachers rather than as a problem for the students. Wherever it is necessary to draw accurate sketches upon the blackboard, as in the geometry or drawing class, this machine will prove of great assistance. It is made up of a trolley which runs upon a light track at the top of the blackboard, a vertical ruler and a horizontal ruler. The vertical ruler can be placed for drawing a line at any place upon the board by drawing the entire machine along the track. By giving the knob a partial turn the horizontal ruler is loosened so that it can be raised or lowered as desired. When the position wished is attained, the rule is clamped by another slight turn upon the knob in the opposite direction. Vertical and horizontal lines can thus be drawn upon the board with great accuracy and speed.


HYGROSCOPE
4
3
10½
1⅛
1


TABOURET
ALL STOCK $\frac{3}{4}$" THICK
12
$2\frac{1}{2}$
$\frac{1}{4}$
12
$\frac{1}{4}$
$2\frac{1}{2}$
1
$\frac{1}{2}$
$10\frac{1}{2}$
$2\frac{1}{2}$
7
$15\frac{1}{4}$
1
4


BLACKBOARD DRAWING MACHINE
Blackboard Frame
SECTION THROUGH TROLLEY
Moulding
Blackboard
SECTION THROUGH KNOB
20
36
48
6 3/4
2 1/2
5 1/4

The dimensions of the machine as shown are those which were worked out by C. L. Johnson to suit the blackboards of East Cleveland. Some of them will no doubt have to be altered slightly to suit the boards where the machine is to be used. The track is made of a light strip of hard wood attached to the upper blackboard frame by screws passing thru small circular blocks which are just long enough to let the wheels of the trolley clear the frame. The wheels are turned from hardwood and should be held away from the trolley board by thin washers or by turning a small hub on that side of the wheel. In order to keep the vertical rule close to the board it must be offset in attaching it to the trolley board, as shown in the section thru the trolley. The vertical rule is composed of two strips beveled at an angle of 45 degrees at their central edges to form the ways for the support of the horizontal rule. A corresponding shaped block travels in these ways, and is connected to the horizontal rule by means of a stiff plate of sheet metal, as shown in the section thru the knob. A small pointer upon the horizontal scale indicates the amount this scale is moved up or down. The knob shown is turned from hard wood and threaded, but a bolt might be substituted for this by using a wing-nut.

SUPPORT FOR BLUE PRINT FRAME.

This support, designed by G. G. Greene, Lane Technical High School, Chicago, is intended to be placed just outside a window, so that it can be closed if necessary, and fits loosely in sockets above and below. It can be easily revolved in any direction or removed when the window is being washed. The upright piece is made of iron pipe, and the bracket of $\frac{1}{4}''$x1′ wrought iron, fitted with horizontal strips of wood to prevent the frame from slipping while it rests at any angle desired. A sliding hook at tthe top helps to hold the frame secure.

CURRENT ITEMS

THE emphasis being placed upon industrial education in Massachusetts has called forth a movement toward "vocational direction." A vocation bureau has been established in Boston, the purpose of which is to advise young men and students concerning the vocation which they shall select. In speaking of this new movement recently Superintendent Brooks of Boston said, "A prerequisite of industrial education is the selection of a life work upon entering school instead of upon leaving it. Under the new conditions vocational direction will not only be concerned with advising a boy to take additional education, but with deciding what kind of additional education he should take. It is easy to advise a boy to go to college. To advise him to enter a certain trade is harder. An industrial education is good for some one thing, but the boy so educated cannot so easily succeed in another line if he finds himself in the wrong one. Education has been criticised because we educate all our boys to become presidents, and millions fail to reach that office. Would it be better to educate all our boys for town clerks because more attain that position?" Superintendent Brooks then advises conservative action. He says, "The demand of the new education today should be, not for a substitute education, but for a supplementary education. Let us not reverse the error of giving all a cultural education, as in the past, by now giving all a mechanical education. The introduction of separate schools will bring upon the American people a new and serious problem, namely, the necessity of an early choice of a vocation. There is a strong belief that no man can tell what the permanent interests and abilities of a boy of twelve may be, and also a deep-seated fear that the widespread selection of vocations for or by children will create more misfits and more serious ones than may properly be charged to present conditions. To meet this difficulty in Boston there is a vocation bureau, and in the schools are the vocation counsellors. These watch the pupils and study their aptitudes and needs, and also study industrial conditions. The school helps the pupil to find his particular career."

NORTH ATLANTIC STATES.

The evening industrial school work in New England appears to have received a great impetus this year. Word comes from Hartford that the evening schools under the direction of Solon P. Davis, supervisor of drawing, has been obliged to turn away 230 applicants because of lack of accommodations. The city is contemplating an addition to the high school building, but until this money is appropriated and the new building erected, it will be difficult to meet the demands of the evening school.

In New Bedford the enrollment in the evening classes is very large, there being 300 men to take places provided for sixty. In the evening school for women there is a waiting list of 500, and space for only eighty students.

The city of Marlboro, Mass., has been notified by the executors of the will of the late Hannah E. Bigelow that they propose to pay over to the city of Marlboro

$5,000 to be expended in giving instruction in manual training in the public schools of that city. It is to be expended under the direction of the school committee. Instruction shall begin not later than March 1st, 1911, and shall continue for a period of not less than five years. The city council has accepted the gift and plans are being made for the beginning of the work.

The success of the Manhattan Trade School in New York City in training young girls to occupy good positions in trade, to obtain good salaries, to rise to better positions, and to become trustworthy, womanly citizens, has attracted the attention of the Board of Education of that city for several years. It is more than eight years since the School was organized by private individuals, which was four years before the organization of the National Society for Promoting Industrial Education. This experiment in trade education was the first of the kind for girls, and one of the earliest trade schools attempted for fourteen-year-old workers. It has conclusively proved that such education is practical.

Superintendent Maxwell of the New York public schools has long wanted to have such a school in the system of New York City, and has urged the matter in many of his reports. It, therefore, seemed well to the New York Board of Education to incorporate the Manhattan Trade School into the public system. The board of administrators of the Manhattan Trade School had begun this school as an experiment to prove that such education was feasible and were therefore glad to have the city undertake the work and thus influence a larger number of students. On account of the success of the school they felt that they would rather wait a year or two before completing the entire arrangement. They therefore have entered into an agreement with the public schools that the school building and equipment be rented for two years and the school be conducted by public instruction. If, at the end of that time, it should be found that the city can not successfully cope with the problem, or does not wish to do so, the work will be taken back again by the Manhattan Trade School Board. On the expiration of two years, if the city has made a success of this class of instruction and desires to continue it, it will be incorporated into the city school system. Many important matters had to be considered and even the city charter had to be changed. An order, however, was passed by the Board of Education and signed by the Mayor to enable the order work of the school to continue and sales be conducted as before. The order work has been an important part of the instruction. The entire policy of the organizer and director of the school has been adopted by the public school authorities and all teachers and workers have been retained, at present on substitute licenses, but to become regular teachers as soon as examination for them can be held. The executive secretary, Miss H. R. Hildreth, is at present acting principal. The former director, Prof. Mary Schenck Woolman will serve in an advisory capacity until the school is well launched, but will not be under the public school system, having returned to her work at Teachers College.

The Mechanics Institute at Rochester, New York, has added much to its equipment this year. A new Fine Arts building is being erected at a cost of $150,000 and a new heating and power house costing $20,000. These new buildings will mean added space for the manual training department. A foundry and new forge-shop will be built and the machine-shop will be enlarged. The space for woodworking machinery will be increased so that work can be done more nearly on a commercial basis. The machine-shop is already doing work for manufacturers in the city and has discarded its old course of "abstract" models.

Thru F. H. Wing director of manual and industrial training, we learn of the progress of the vocational school work in Buffalo, New York. There are now four schools, one for cabinet-making, carpentry, electrical construction and printing; one for joinery, wood-turning, pattern-making, and modeling; one for printing and bookbinding; and one for carpentry and sheet metal work. Two hundred and sixty boys are now enrolled in the four schools, and these are taught by a staff of ten teachers. The first school of this character was opened last year with two teachers and fifty pupils. At present the principals of the schools do the academic teaching and they will continue to do so until the schools grow large enough to warrant other arrangements. The buildings and equipments are costing about $30,000.

Another important action in Buffalo is the placing of the manual training work of the first four grades under the direction of the supervisor of art instruction, C. Valentine Kirby. This is the result of a suggestion made in the new state syllabus, and bids fair to strengthen the work in the lower grades. It is to be hoped that other cities will follow this example.

Auburn, New York, has recently organized a new department of manual training for high school students. A former grammar school building has been utilized for this purpose. The work in under the direction of Chesley H. Smith.

A location has been selected for the proposed new building for the Central Manual Training School of Philadelphia. It is hoped that a sufficient appropriation will be secured to make this building a fitting abode for the historic school which has done such excellent work under the administration of Dr. William L. Sayre. Certainly the city of Philadelphia should do nothing less than give this school the modern building it needs.

SOUTH ATLANTIC STATES.

An encouraging word concerning industrial education in colored schools comes from the Negro Conference at Hampton, Virginia. Jackson Davis the newly appointed state supervisor of colored schools, who has already been instrumental in starting industrial work in several Virginia towns, declares that industrial education has already won the interest and respect of the best people, both white and colored, and that good results are already beginning to appear in improved homes and more efficient children.

Manual training and domestic science are being introduced into the public schools of Wheeling, West Virginia, this year. Work is being given in the seventh and eighth grades and the first two years of the high school. W. G. Carpenter of Altoona, Pa., is in charge of the work in manual training and Miss Marie Kellogg of the University of Chicago is instructor in domestic science.

The department of manual arts of the State Normal school at Athens, Georgia, thru its director Fred J. Orr, is carrying on a most worthy campaign in the interests of better school building in the rural districts and towns of the state of Georgia. Mr. Orr has offered his services to village and county boards of education. On invitation he visits the school site, draws plans for contemplated buildings or suggests schemes for beautifying grounds and interiors. All this he does without cost to the board, except enough to cover traveling expenses and other incidentals. He also gives free of charge a stereopticon lecture on the subject of "Home and School Buildings" in which he discusses the difference between good and bad design in houses, and economical methods of finishing and furnishing interiors. Mr. Orr's practical experience in architectural work enables him to render this unusual service. Already his work has reached some twelve or fifteen counties in the state. As far as possible he gives the students of his department an opportunity to help in this work.

The industrial school at Tallulah Fall organized by the Georgia Federation of Woman's Clubs has recently installed a workshop in which native industries will be carried on.

Putnam county in the same state has organized industrial work in several of its high schools. Shopwork will be formulated to meet the needs of the agricultural community.

Poplar Springs school in Laurens county has a well equipped woodworking shop. This is an ordinary consolidated country school, but it is accomplishing a great deal for the surrounding country under the stimulating guidance of Miss Emma Perry and her associates, all of whom are graduates of the State Normal school at Athens.

NORTH CENTRAL STATES.

With the prosperity of the farmers in the Central States and the enrichment of the city high schools, there is a noticeable increase in the movement of students of high school grade toward the cities or toward the larger high schools offering modern courses of study. An interesting example of this is found in Richmond, Indiana, where seventy-five pupils residing outside the city of Richmond have entered the hgh school this fall. This is an increase of more than twenty-five over last year and is attributed directly to new facilities for manual training. For each pupil who is transferred from the township to the city high school, the township has to pay into the city treasury $4.00 a month, an amount which is fixed by law. About $300 per month will be added in this way to the funds available for the high school in Richmond.

Manual training is being extended this year in Toledo, Ohio, under the supervision of Carl T. Cotter. In districts where pupils are likely to leave school early, shopwork and cooking are being taught in the sixth and seventh grades. To these same pupils machine sewing and mechanical drawing will be given in the eighth grade. In districts where there is a large foreign element in the population, manual training is given twice a week. This is an interesting discrimination in favor of the foreigner. We are wondering why he is not given manual training four times a week instead of two. Then manual training would come to its own and show the desired results.

The Central High School in Grand Rapids, Michigan, is expected to be ready to receive classes at the beginning of the second semester about January 30th. It is probable, however, that the manual training work will not be started in the new building until the following September, tho the domestic science and art classes for girls will be organized at once. Another building on the other side of the river known as the Union High School is expected to be ready for occupancy about the same time. In this building the equipment for cabinet-making and wood-turning will be ready at the time of opening, while the rooms for metal-working will not be equipped until September. Another feature of the work in Grand Rapids this year is the opening of an "Auxiliary School for Exceptional Children." This is one of the old grade school buildings. There are four rooms in the building and it is planned to use one of them for benchwork, another is a combined cooking room, dining room, and laundry, a third is used for handwork in raffia weaving, clay modeling, and cardboard construction. The remaining room has been fitted with tables to be used for academic subjects. In this school are placed pupils who are exceptional in one way or another.

The towns of Chaska and Shakopee, Minnesota, which are a few miles apart, are planning to employ a manual training teacher who will divide his time between the two towns, supervising the work on alternate days in each place. This experiment suggests many possibilities for the extension of manual training in small towns and even in rural communities. Four suburbs of Cincinnati have combined in a similar way to get instruction in manual training and there is every reason to believe that the country schools following the plan suggested by Clinton S. Van Duesen could profitably unite in securing competent instruction in the manual arts. The folly of attempting to secure the desired results from the average country school teacher, who has received no special training in the manual art, has already been demonstrated in several instances. The results of such experiments as this one in Minnesota will be watched with interest.

Compulsory education in trade or continuation schools for children who have passed the age of compulsory education in the common schools and who are not voluntarily attending such continuation schools or any other schools, is a proposition now under consideration in the state of Wisconsin. A special committee has been appointed to draft a bill for presentation to the legislature.

Manual training is progressing in South Dakota. Departments have already been started in Sioux Falls, Mitchell, Deadwood, Pierre, and Lead, also in the normal schools in the state. Lead is reported to be the only city having a department of domestic science. The manual training work in Lead now occupies the time of two teachers on full time and two on part time. The equipment for the manual training has cost about $3,000, and that for the domestic science about $2,000,—four rooms for the former and three for the latter. Manual training is taught in all the grades from the first to the eleventh, and domestic science in grades from the fifth to the tenth. The work is required of all pupils up to the eighth grade after which it is elective.

The manual training work is beginning to get a good start in Montana. The work in Helena under John W. Curtis is progressing as rapidly as conditions will allow. Miss Ida M. Eells from Teachers College is now in immediate charge of the manual training for the lower grades. About the middle of last year woodworking was introduced for boys in the grade schools at Great Falls. The work continues this year at Missoula where they are giving benchwork to the boys of the lower grades only. Bozeman also started manual training last year. At Butte Mr. MacTarnaghan resigned at the end of last year and his place as supervisor has been taken by Carl Warner. Blacksmithing has just been added to the manual training subjects offered in Butte.

Friends of William Hawley Smith will be interested to learn that he has accepted a position on the editorial staff of School and Home Education, published at Bloomington, Illinois. In the September number Mr. Smith gives a few striking paragraphs on the subject of "racing," in which he speaks of visiting an old friend in a repair shop and watching him do a piece of work with "almost incredible skill." In the course of the conversation Mr. Smith said: "Is there any need of doing a job like that better than you are now doing this one?" The friend replied: Every job, no matter what, should be done just as well as the materials and conditions will permit." He then went on talking, and here are some of the things he said: "In all my work as a mechanic, I have always tried to do one thing, and that was, to constantly outstrip myself. If, in doing that, I surpass what someone else has done, all right; but that is only an incident. Merely beating somebody else's record cuts no ice for me. I might do all that and still not be so very much of a mechanic in my own estimation or anybody else's. But every time I do better than I myself have ever done before, I do something that counts, and that stays with me for good."

The city of Des Moines, Iowa, is considering the advisability of applying the commission form of government to its public schools. A committee has approved a plan which involves the selection of a commission of five experts upon whom the burden of the school administration will fall. These experts will be as follows:

A commissioner of scholastic and moral instruction to be designated as superintendent.

A commissioner of hygiene and physical culture who shall be a physician.

A commissioner of manual training and domestic economy.

A commissioner of buildings and play grounds, and social centers, who shall be an architect.

A commissioner of business management.

It is interesting to notice the assignment of duties outlined by the proposed plan. The commissioner of manual training would have "supervision of all work and instruction in manual and industrial training, including penmanship, drawing, music, modeling, wood-carving, domestic economy and the allied arts and crafts; the appointment and certification of all supervisors, special and regular teachers and assistants in his department; and the power of supervision and removal for cause stated in writing to the board." It will be interesting to see what becomes of this report.

SOUTH CENTRAL STATES.

Very little actual installation of work in the manual arts has been accomplished in the state of Kentucky during the past year owing to the fact that the people have been too busy passing new school laws. This fundamental reform having been accomplished, a wave of feeling is pushing forward improvement in the schools themselves, and the people hope to add manual training and home economics in many schools during the present year. At the annual meeting of the Federation of Woman's Clubs in Frankfort in May, a resolution was passed urging the installation of courses in home economics in all the schools in the state, and a committee was appointed to work up interest during the year.

Of the actual work accomplished during the past year the Eastern State Normal school at Richmond has added agriculture to the course of study. Berea College has crowded all its industrial departments into one school called "The Vocational School," and has bought property near Simpsonville to build its colored idustrial branch to be called "Lincoln Institute." The state has raised $50,000 to meet the offer of $350,000, and of this $50,000, the colored people themselves raised $20,000, which sum is a most helpful sign of their progress.

John Little, in his industrial school for colored people in Louisville, has added house cleaning to his working department, expecting to send out girls prepared for household service.

During the past year the industrial work in Louisville has been given a new impetus by the appointment of a special supervisor, Miss Sarah Logan Rogers, who has extended the work thru the fifth and sixth grades. The industrial work has been in the primary grades for four years, and manual training has been a feature of the high school in Louisville for a much longer time.

The manual training department of the El Paso, Texas, public schools opened its third year of work with twelve instructors in addition to the supervisor, Edwin A. Ross. The new teachers this year are D. W. Nicolen from Bradley

Polytechnic Institute, R. H. Woods from Stout Institute, Miss Helen Newell from the Texas College of Industrial Arts for Girls, Mrs. Margaret Murphy from the University of New York, and Miss Marcia Potter from Stout Institute. D. C. Cole has been placed in charge of all the woodworking and Miss Elizabeth Koger has been made supervisor of domestic economy.

The equipment now consists of eight woodworking shops with modern benches and tools, one mechanical drawing equipment for high school work, one applied design equipment for textiles and work in clay, metal and leather, and equipments for primary manual training work in clay, paper, etc., four laboratories for teaching domestic science, and twelve for teaching domestic art. In the Mexican schools all girls who are large enough receive instruction in sewing, cooking and laundry work, and all the boys instruction in woodworking.

WESTERN STATES.

The phenomenal results attained thru irrigation in Southern Idaho are given as the cause of a new movement toward the teaching of agriculture in the schools. A department of agriculture, also a department of domestic science, have been established this year in the Albion State Normal School. Last year a department of mechanic arts was opened. Each of these departments is expected to find expression in the work of a model farm. This will mean the building of a house and barn, fences, agricultural implements and tools, the decoration and furnishing of the house, planning equipments for barns, sheds, silos, etc. Thus will be provided good problems for the department of mechanic arts, and to some extent for the department of domestic science. J. L. Stenquist, who is in charge of the department of mechanic arts is expecting to do most of this work with classes below high school grade.

Remarkable progress is being made in the development of manual training high schools in southern California. The new $80,000 addition to the Los Angeles Polytechnic school is being occupied for the first time this fall. This school was the outgrowth of the commercial department of the Los Angeles High School, and until this year has been under the direction of J. H. Francis, now superintendent of schools in Los Angeles. The Hollywood High School, now a part of the Los Angeles school system has asked for a $25,000 addition for shops and their equipment. The new manual arts high school of Los Angeles opened its doors for the first time on September 12th. The enrollment is over 800. Preliminary steps have been taken for the erection of a new $250,000 polytechnic high school at Santa Monica. A course in agriculture will be a feature of this new school. The city of Long Beach has voted $250,000 for a new polytechnic high school. Specifications have been accepted and the school board is advertising for bids on construction work. The polytechnic department of the Pomona High School is comfortably located in a new building adjacent to the old school building. They have installed a foundry in addition to benchwork in wood. Riverside has voted $240,000 for a boys' polytechnic high school to be opened at the beginning of the next school year. The old high school is to be used for girls only. Few cities of the size of Riverside are able to maintain two distinct high schools.

In 1909 the University of California added to its list of subjects for entrance credit the following courses: Industrial arts, mechanical arts, applied arts, sewing, and domestic science. This action on the part of the University has had a stimulating effect, the high school people being more than anxious to meet the wishes of their constituents in the matter of introducing industrial subjects. The greatest difficulty in meeting the present situation is the inadequate supply of teachers in mechanical and domestic arts. The state legislature at its last session established a normal school of manual arts and home economics at Santa Barbara, but there is room for further provision for the training of teachers to meet the present demand.

The Miranda Lux Bequest amounting to nearly half a million dollars is now available. The trustees of that fund have arranged to cooperate with the California School of Mechanical Arts, and will soon begin by offering instruction in sewing, cooking and textiles for prospective teachers. Full-fledged normal courses in domestic science will not be organized, but the school will cooperate with the University of California which has just organized a series of courses in domestic economy, and also with the San Francisco State Normal school. These new courses at the California School of Mechanical Arts will be put into operation in January, 1911.

At the same time this school will begin evening instruction for apprentices and young journeymen who are engaged at their several trades in the day time. These evening classes will be mostly shopwork, the idea being to endeavor to solve the problem of overcoming the defects of the American apprenticeship system or rather the decadence of that system.

This work also will be carried on under the Miranda Lux Bequest. This bequest was made in 1894, but the funds have not become available until now, the property having been tied up in the form of extensive land holdings which could not be readily turned into income-producing securities. In its terms the bequest is unusually liberal, stating its purpose to be "the promotion of schools for manual training, industrial training, and for teaching trades to young people of both sexes in the state of California and particularly in the city and county of San Francisco."

At the last meeting of the California State Teachers Association a commission was appointed to investigate the needs of industrial education in the state and to report at the next meeting of the association in December, 1910. The chairman of the commission, Harris Weinstock, a retired merchant, is one of the most prominent men in California, devoting most of his time to civic and philanthropic work. This commission has prepared a bill for presentation at the next session of the state legislature, subsidizing the teaching of the industrial and agricultural arts in the various communities thruout the state. This bill is somewhat similar to the Massachusetts law except that it does not provide for separate industrial schools, leaving much to the discretion of the local authorities.

REVIEWS

Our esteemed fellow craftsman in England, H. Williams Smith, editor of *Manual Training,* has written such an appreciative and spicy review of the 1910 report of the Western Drawing and Manual Training Association that we wish it were possible to reprint it here in full. It begins thus:

"My house has a flight of steps to it, as befits the dignity of an editorial residence. The money I earn writing reviews just about covers the cost of whitening the steps. I do not think the postman likes my steps as much as I do. One evening he stamped up them as if he was trying to break them down. I wondered at his display of temper, until he handed in a package which fully accounted for his actions. That package contained a report weighing something less than a stone, and that report contains matter which to read takes something less than a month—but not much less in either case. I've handled all the report, and read all the matter, so you can place faith in my statements so far. Now if you'll just fill your pipe and sit down in that easy chair, I'll tell you something about what our confreres in the Western States are saying and doing. Please don't look so bored over it; it's all very interesting, and I'll be merciful in the length of my comments."

But he isn't. He goes on and on like a newspaper reporter, tho he is not writing merely to fill space. His praise is encouraging, his criticisms frank. After commenting on the address of Henry Turner Bailey and demonstrating that he has caught the personality as well as the thought of Miss Gearhart, thru her report, he proceeds as follows:

"Prof. W. Sargent emphasizes one bye-issue of manual training thus:—'Thru constructive work a child not only gains useful knowledge of such constructive processes as every householder should know, but is brought to understand and interpret things in terms of the human skill and effort required to produce them, rather than in the terms of prices at which they can be bought in the stores.' The foregoing is an excellent example of how a clear thinker dignifies his subject. I wish manual training were more often referred to than it is, in terms of sociology rather than technology. Prof. Sargent also questions whether repeated processes are non-educational, and says: 'There is need for more investigation on this point. . . . Doing certain things till the process becomes automatic sometimes leads one to take the first step toward a higher freedom.' The greatest value of design as a factor in the art education of our common schools is put by Prof. Sargent axiomatically: 'For one who will produce a design a thousand must know how to select it.' As our Dr. Hayward contends, so much is made of ***expression*** in our schools that ***impression*** is undervalued."

Mr. Smith agrees with Professor Selvidge, and with Mr. Upton's statements of the results of teaching drawing in the workshop. He gives emphasis to Mr. Upton's views by adding:

"It is an educational crime to have scholars preparing drawings on the work-benches; for thereby they are misusing their time, and often also keeping other

eligible boys away from the benches altogether. Drawing should be done as nearly adjacent to the handwork room as possible, but never in it."

Mr. Smith pays a compliment to the women, claiming that the discussion on household arts is the best in the report. He even says that women "can talk, not only more, but more to the purpose than most of the men," and in these days an Englishman surely ought to know. He gives the "honours" to Miss Snow and then makes a thrust at our reformed spelling which he calls "deformed." But he graciously adds:

"These little grumbles apart, the report is simply magnificent, and reflects the highest credit on the Editorial Board and its helpers. I have dealt with it at great length, for I believe that our readers, who are scattered in all parts of the globe, should have a faint idea of the splendid work that is being done in the Western States.

"My last word is, 'Get the report for yourself.' It sells at fifty cents (marvellous value) on the other side, and an enquiry to Ira S. Griffith, Supervisor of manual training, Oak Park, Ill., will, I am sure, meet with a courteous response."

A Practical Course in Mechanical Drawing. By William F. Willard. Popular Mechanics Company, Chicago, 1910; pp. 134; price, 50 cents.

In the introduction the author states the purpose and use of mechanical drawing, and then explains briefly the difference between perspective drawings, sketches and working drawings. The description of an equipment for mechanical drawing given in the second chapter shows the author to be an experienced draftsman, and the instructions for the use of material, tho brief, are valuable to any student.

Chapter III contains a large number of geometrical problems which are very good in general, but largely abstract, and not nearly as interesting to a high school boy as concrete problems where the geometrical principles introduced are incidental. The statement of the method of drawing a line thru a given point parallel to a given line is certainly very faulty, as is also the key for finding the number of degrees in an angle of any polygon. In other cases the lettering on the drawing does not correspond to the directions for working. Other errors, possibly typographical, lead to confusion. The author's direction to construct involute teeth by laying off the involute from tangents to the pitch line, instead of the base line, does not correspond to his drawing and is wrong and misleading. The chapter on conventions used in drafting contains many good suggestions stated clearly and briefly. This is a chapter that can be read repeatedly with profit, as attention is called to essentials which should be learned as early as possible.

A brief chapter on working drawings contains a number of drawings in isometric projection from which pupils can make detail drawings of important engine parts without having castings as models.

The chapter on pattern work, shop drawings, and penetration contain standard problems in developments quite similar to those found in other texts.

The book contains a large number of neat drawings carefully lettered. The considerable number of errors which are found in the book will greatly lessen

its usefulness as a text. Most teachers of mechanical drawing do not care to spend a great deal of time on geometrical problems which will usually be forgotten unless introduced as parts of the construction of some working drawing. A large number of geometrical problems required at the beginning of a course in mechanical drawing will interest the average boy about as much as a course in Russian joinery does in the shop. Most schools have dropped the old Russian system and now have complete useful articles, teaching the same principles taught by the joinery method. For the same reason courses in mechanical drawing in the near future will include fewer geometrical problems, and more practical working drawings containing the principles of geometry that are useful to a draftsman. The author may have had this in mind in naming the book, but partially forgot it in introducing so many geometrical problems before taking up any working drawings. A. C. NEWELL,

Director Manual Training, Illinois State Normal University,
Normal, Ill.

Modern Lettering, Artistic and Practical. By William Heyny. Published by William T. Comstock, New York, 1909; 7½ x 10 inches; 136 pages; 35 full-page plates; price, $2.00.

The book outlines a course of study in lettering for artists, architects, sign writers and decorators. It treats of the construction of pen-and-ink designs for commercial uses, advertisements, letter-heads, business cards, memorials, resolutions, etc. It is divided into four parts as follows: (1) the drawing materials, (2) practice work, (3) the alphabets, practical and artistic—their history, description and proper use, and (4) the proper and artistic employment of lettering.

The book is practical. Unlike many books on the subject, it is free from eccentric and over-decorated alphabets. The aim of the author is to give the proportions and construction of the best and fundamental types of letters. The plates are well executed and show the work of one thoroly experienced in the art of lettering. —L. L. SIMPSON.

Simple Jewelry. By R. L. B. Rathbone. D. Van Nostrand Company, New York, 1910; 8¼ x 5½ in.; 280 pages; price, $2.00.

This is a practical handbook dealing with methods of design and construction. It is quite elementary, yet it deals with some of the complex as well as the simple processes. However, it places emphasis on the simpler technical processes, and in doing so proceeds on the principle that "design and workmanship must act and react on each other." For the practical working out of this principle as well as for technical descriptions and the many illustrations, the author is to be commended. The book is written for the use of craftsmen, designers, students and teachers, and seems to meet a real need.

RESERVED FOR LATER NOTICE.

Making of a Trade School. By Mary Schenck Woolman, professor of domestic art, Teachers College, Columbia University, published by Whitcomb & Barrows, Boston, Mass.

Principles of Educational Woodwork. By C. L. Binns and Rufus E. Marsden, published by E. P. Dutton & Company, New York.

Handwork as an Educational Medium. By P. B. Ballard, published by Swan, Sonnenshein & Company, London.

Technicher Unterricht. By Ed. Grimm, teacher in manual training school at Bremen, published by Frankenstein & Wagner, Leipzig.

Lehrgang fur de Hobelbankarbeit. Issued by the German society for the promotion of boys' handwork, with seventeen plates and fifty-eight illustrations, published by Frankenstein & Wagner, Leipzig.

The Worker and the State. By Arthur D. Dean, chief of division of trade schools, New York State Education Department, with introduction by State Commissioner, Andrew J. Draper. Published by the Century Company, New York.

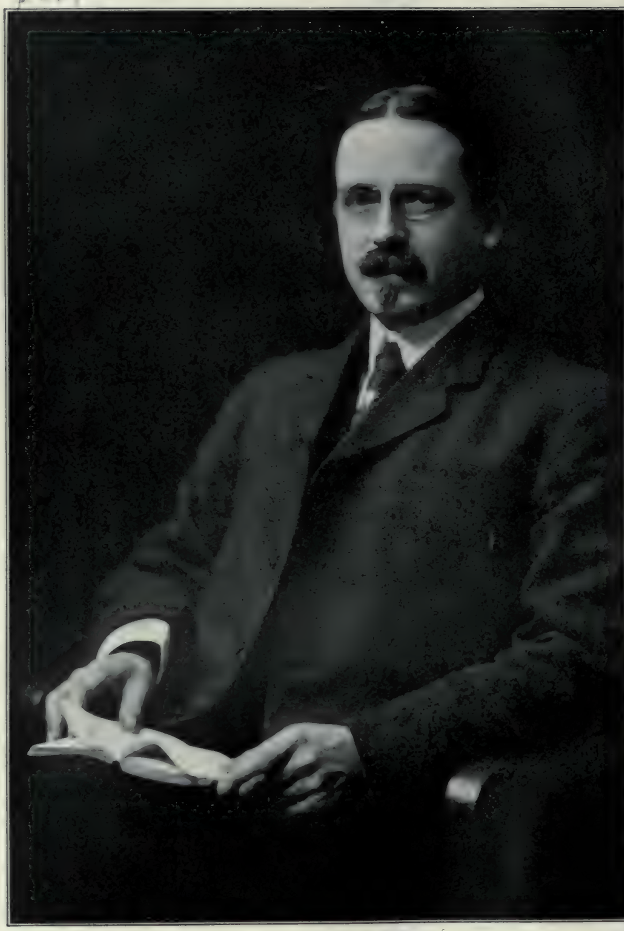
RECEIVED.

Syllabus for Secondary Schools, 1910. Education Department Bulletin, Albany, New York. The last twelve pages of this book of 481 pages are devoted to manual training. It outlines a first-year high school course in joinery, giving exercises, models, and a list of equipment, with cost of tools; also a second-year high school course in wood-turning, pattern-making, modeling, and casting, treating these subjects in a similar way. The syllabus also outlines four courses in mechanical drawing and one in architectural drawing. Under "conventions and rules of practice" are some details valuable to every teacher of drawing and calculated to set a higher standard for drawing in New York State. The volume also contains outlines for freehand drawing, home economics and domestic art.

North Central Association of Colleges and Secondary Schools. Proceedings of meeting held in Chicago in March, 1910. Contains president's address on "The Logic and Method of Industrial Education," by Dr. C. M. Woodward of St. Louis, Missouri; also a paper on the "Cleveland Technical High School" by James F. Barker; one on the "Fitchburg Plan of Industrial Education" by W. B. Hunter; and discussions by several others interested in industrial education.

Cleveland Public Schools. Annual report of the superintendent, W. H. Elson. As usual, Superintendent Elson's report discusses modern problems, and is attractively illustrated. Chapter four, on increasing opportunities for technical training will be especially interesting to our readers, tho the chapter on simplifying the elementary course of study and the one on measuring efficiency and progress may be just as helpful, even to the teacher of manual training.

Manual Arts Number of the Oshkosh State Normal School Bulletin. Fifty-eight pages of text and three charts showing course of study; price, 20 cents. The feature of this bulletin that will attract special attention is the woodwork for the primary grades, most of which is construction work with lath and nails. The variety of problems worked out in this material, and the discussion of aims and methods are especially interesting to the supervisor of manual arts in primary grades.



DR. JAMES PARTON HANEY

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THE RELATION BETWEEN AND THE CONTENT IN MANUAL TRAINING AND ENGINEERING SHOP COURSES.

FRED DUANE CRAWSHAW.

WITH the introduction of the engineering college came the question of the relation between the work to be done in the shops and the work to be done in the laboratories, drafting rooms, and recitation rooms for each of the courses of study. The question has been answered in very different ways in individual colleges, depending upon the particular thing for which the college has stood. In general the colleges of engineering of today in the United States may be divided into three classes, depending upon the character of their shopwork, viz.:

a. Those in which the shopwork has a distinct trade quality because the shop courses are designed primarily to make good mechanics.

b. Those in which the shopwork is incidental to lecture and quiz work designed to acquaint the individual student with manufacturing methods in shop management, economy, and production.

c. Those in which the shopwork goes hand in hand with engineering laboratory work to keep constantly before the student the value of shopwork as a help in forming an engineering judgment and solving engineering problems.

It is probably true that no engineering college can actually be put into any one of these three classes. The fact that some of the shopwork done in it would also be included in the shop course of the colleges of one of the other classes, makes a definite classification impossible. However, a careful study of our American engineering colleges will convince one that the particular tendency of the shop course is in one

of the three directions indicated. Now the significance of the character of the shopwork lies in the fact that colleges in each of these three classes claim to be engineering colleges. It is fair, therefore, to ask the question, whether or not the shopwork done in each class is strictly speaking a legitimate part of an engineering education. This question leads one to ask another: What is engineering? or, What constitutes engineering education?

THREE KINDS OF ENGINEERING COLLEGE.

In answer to the first question, it is my purpose to analyze briefly the work done in colleges of each of the three classes.

A college in class *a*, if well equipped, will have a variety of machines limited only by the financial means and the floor space at the disposal of the college; also by the number of trades for which the college finds it convenient and profitable to prepare students. It will be noticed, too, upon investigation, that where there are a number of machines of one kind there will be installed only one or two of any one manufacturer. In studying the course of study in our class *a* college, we will invariably find that it is designed to emphasize the range of possibility in the use of machines. Very little time will be devoted to lectures or demonstrations except those which have to do with machine processes. For a considerable period of time in the course the work done in each shop will be exercise work, or the making of pieces, which holds the students' attention upon the method of producing certain results with a particular machine.

Doubtless such a course in a shop equipped as described is valuable for any one who is to work as a mechanic; but it is a question whether it will be of the greatest possible service to the man who is to do engineering work. The engineer needs to know which machines, designed to do a particular kind of work, will produce results of a certain grade in the shortest time and with the least expense for operation and maintenance. He needs to know how to get results rather than to be able to get the results with his own hands. He must know the relation one machine has to another in certain factory processes and why each machine is made to do certain things, rather than to know how to do them in great detail himself. He must study the mechanical principles involved in the operation of a machine he uses in order that he may be inspired to improve this machine, rather than to learn how to manipulate a machine to produce a given result. This manipulation

any good shop mechanic may master. As an engineer he will not be called upon to run a machine. Hence such a course as the college in class *a* gives tends toward the education of mechanics and tradesmen rather than engineers, and should be given in the industrial or trade school, not in the enginering college.

The college in class *b* will equip its shops with quite as large a variety of machines as the one in class *a*. It may even instal a larger variety to illustrate special processes in manufacture. It probably will not have many machines of one class, and these probably will not come from many different manufactories. The course of study will not call for a large amount of exercise work, but will emphasize exercises in the making of machine parts which will be used in the assembling of the parts of a finished machine. An inspection of the course of study will reveal an emphasis laid on manufacturing because considerable time will be allowed for lectures, demonstrations, and quizzes. It will be found, too, that these do not bear particularly upon the running of machines, but rather upon their use in manufacturing processes. They will include the management of shops, the economics of production, the relation of the shop to the drafting room and sales department, and the careful consideration of stock—the raw material as related to the finished product.

The course will provide for a sufficient amount of bench and machine operation to train the student to do many fundamental things well; but thruout the course it will be noticed that the purpose of all the shopwork is to make producers or makers of machines rather than users of machines. In other words, to make manufacturers or superintendents and foremen rather than mechanics and tradesmen.

Now the manufacturer is one type of engineer. In fact the manufacturer may be an engineer in the truest sense, for he may be conducting a manufacturing establishment in connection with his work as an engineer to produce material for engineering projects. However, the course of study for the college in class *b* does not emphasize engineering as such. The machines are used entirely as producers of some salable product rather than efficiency instruments in production. The student is urged to consider the money value of machine production rather than the value machine production will have in his work as an engineer to aid humanity. He learns to value his service in its relation to a corporation or company rather than to the community at large. In the shop course for colleges in class *b* the student is led toward engineering, if at all, because he sees the possibility of his becoming a producer of

engineering materials. He is not led necessarily toward engineering because his shopwork prepares him to use engineering materials in harnessing nature's forces or overcoming nature's insufficient means of gratifying man's wants.

The shops, then, in the engineering college should not only teach a man how to make things by operating machines and how to use men and machines in the production of new machines, but they should inspire men to overcome natural obstacles to human progress by using the knowledge obtained in the shop. By this means the shops in an engineering college are made a means to an engineering end; they help to make engineers, not mechanics, because they are laboratories in the scientific sense as well as the mechanical sense. Such shops will be found in the colleges in class *c*.

In this third class of shops will be found the same machines as in the shops in class *a* and class *b*, but there will be also many devices which are ordinarily seen in testing laboratories. There will be such pieces of testing apparatus as the following: Prony brakes, speed and pressure indicators, volt and ammeters, steam engine indicators, torsion and bending testing devices, etc. It will be discovered that the things which are being made are in many cases made as the result of some experimental calculations in the classroom or laboratories. Students will make machine parts similar to those made in colleges in class *b*, but they are made to definite sizes and to fit certain conditions because the student has previously determined by calculation and experiment what these sizes and conditions should be. Then, too, machines will be run under different conditions of power and load, and in different combinations, not to determine alone the economy of production of the thing being made, but to determine also the engineering principles involved and to develop in the student the power to judge results in a way that the engineer is called upon to judge results.

Again, the shop lecture and quiz will have a different character at times from those in courses under class *b*. They will not consider alone ways and means of machine manipulation and machine production, but they will deal with the "if", the "why", and the "when" of different problems. These terms will be used in connection with results or ends sought rather than with means. They will be negative rather than positive in character. The student will be given questions to solve, together with instructions to do. Knowing certain facts and wanting certain results, he will make simple investigations and perform certain experiments before he carries out his directions checked by the

instructor rather than given him by the instructor. In a word, he will learn to get results by using the methods of the investigator and the engineer.

The result to the individual student of shop courses in colleges in class *c* will be one of two things, viz.—to eliminate from the engineering colleges those students who will never make engineers because of their lack of natural fitness and ability, and who might better occupy their time in other preparation; or, to train those students, who are endowed with, or can acquire, an engineering sense and judgment, to be engineers in college as well as out of college. The shop courses in colleges in class *a* and class *b* are based upon an antiquated and almost obsolete principle in education (so far as the engineering student is concerned), viz., the school prepares for life. The principle in education today which has superseded the one just mentioned is, *the school is life.* The shop course in an engineering college should be engineering life to the one who takes it. The engineering student should be doing engineering work as well as shopwork in the college shop. The course in class *c* is designed for this purpose and it may and should do for a student much, if not all, that courses in classes *a* and *b* will do.

MANUAL TRAINING SHOP COURSES.

We have thus far treated in a general way the elements of characteristic engineering shop courses, and drawn certain conclusions with reference to each. Inasmuch as this thesis deals with the relation between manual training and engineering shop courses, certain facts concerning manual training shop courses must be given attention and some conclusions drawn with reference to these facts.

Manual training is a term applied to handwork taught in schools which is designed to give instruction to students in the underlying principles of industrial and shop processes. It is considered a subject of cultural as well as of technical value because it is supposed to deal with the fundamentals of education while it is training him in certain technical processes and giving him a certain skill in the handling of tools.

The mere fact that manual training is generally conceded to have a two-fold object, viz.: educational in the broad sense of this term, and instructional in the technical sense—has led to a great diversity of opinion concerning the nature of manual training courses. Some educators contend that all manual training from the kindergarten thru the high school must be based upon psychological and pedagogical prin-

ciples. This has been the means of forming different schools or classes of manual training teachers, such as the social-industrial school, the ethical-culture school and others; each having certain laws which have been established by the psychologists and students of education. Another class of manual training teachers, generally those whose early training was in the enginering schools or in the industries, holds that manual training, especially in the high school, must be preparatory to engineering and industrial activities. Consequently, it must deal jointly with technical and industrial processes and therefore develop skill.

While it is true that manual training first got its basic principles from such great educators as Fröbel and Pestalozzi, who studied the education of very young children, it is also true that in this country manual training was developed by men who were primarily interested in manufacture and the education of mechanical specialists. In consequence of this last fact, in the United States it was started in the upper high school grades with boys and girls just entering into manhood and womanhood. From this point it worked down thru the grades to the kindergarten.

It is true that in late years considerable attention has been given to manual training in the lower grades by American teachers, but for the purpose of this thesis upper grade or high school manual training only need be considered.

Manual training started in the United States in such educational centers as the old Mechanic Arts High School in St. Louis, the Manual Training High School in Chicago, and the Mechanical Department of Purdue University. It was given a great impetus in these centers because it was advocated that boys and girls—and in the early years boys were considered principally—should be taught to use their hands so that when they left the high school, they would be prepared for a life of industrial activity as mechanics and as foremen and superintendents in manufacturing plants. A definite bread and butter value, therefore, was given to the work of these schools, with the result that elaborate equipments were installed for training in several branches of mechanical work. The wood-shop, forge-shop, foundry and machine-shop very early became the places for manual training courses.

Now this shop organization in the manual training school soon became the beginning of one of two things: first, a training—more or less inadequate, to be sure—for the trades; or, second, a training in the direction of engineering education. This latter development came when, as students pursued their work in the manual training shops and as

engineering work in this country assumed the dignity of a profession, there dawned upon the school authorities the possibility of manual training as a preliminary step toward engineering.

MANUAL TRAINING SCHOOLS OF THREE TYPES.

Today, then, we have three distinct types of manual training schools in America:

a. The manual training school which bases its course upon educational theory as developed in schools of education in such departments as those of psychology and child study. These schools produce teachers and philosophers rather than mechanics and engineers.

b. The manual training school which is located in a commercial or industrial center and is governed by a body made up largely of men from the industrial world. Schools of this type have for many years turned out men, a large percentage of whom have gone into manufacturing establishments, but who have been found rather poorly prepared either as mechanics or men who become efficient foremen and superintendents.

c. The manual training school which has the same relation to the engineering college as the academy has to the college of liberal arts. These schools have given to their graduates a desire to do, some day, a high grade of investigational or experimental work in applied science, and so they have found a place in colleges of science and colleges of engineering.

In order that the relation between these schools and the three types of engineering schools considered in the first part of this thesis may be shown, the following brief outline of manual training shop courses is given: —

In manual training shop courses in schools under heading *a,* one finds work being done which has a distinct theoretical basis. The course of study is based upon an outline which in many cases has been furnished by the school's department of education. Particular attention, therefore, is paid to the working out of educational theory in the development of motor activities. The subject of interest is often given first consideration, and in not a few cases a misconception of this much abused word is the result. Pupils are allowed to start large projects without much, if any, preparation in tool manipulation. Furthermore, the object of this kind of work is neither technical skill nor the completion of objects which have a distinct utilitarian, industrial, or shop value. Rather, the object seems to be the gratification of childish whims. In such courses

students are liable to find that they have overestimated their ability. Before their undertaking has assumed any definite proportions they are discouraged and the project is abandoned. The value of constancy of purpose, which always results in the building of character when a problem is continued to its completion, is lost, as is also the prime motive of such a course, viz.: the working out of the child's own ideas. In fact nothing seems to have been gained in such a process. It is a question if the student has not actually lost, because his lack of success has developed in him just the reverse of those sterling qualities which count for success in men's achievements.

The shops in such schools are not pervaded with the spirit of investigation, neither are they commercial in the sense that the spirit of industrialism pervades them. They are neither laboratories nor shops in the best sense. It is possible that the training received in them leads toward pedagogical research, but it certainly does not lead toward commercial or engineering activities.

Shop courses in manual training schools of type *b* are the ones having most prominence at the present day, principally because they are the oldest. They started as a result of a feeling on the part of some educators and many businesss men that the ordinary high school course does not give a boy a training which will enable him to make a living. Courses in these schools are not designed nor are they constructed to teach trades; they are planned to teach the fundamentals of trades and to develop more of the human faculties than the course in the ordinary literary or classical high school develop. As a rule they have accomplished their purpose. They do not, however, unless the school has truly become a trade school, make bread winners. The result of this deficiency has led to the present wave of industrialism in education, which is forming public opinion in favor of the trade and industrial school.

Shop courses in these schools are based upon established educational theory and upon fundamental trade principles. They have won, therefore, the commendation of educators and manufacturers. The mechanical processes that are taught generally develop in the student clear thinking and a fair degree of technical skill. They usually open the eyes of the student to this extent: he is able on the completion of his high school course to determine whether or not he is adapted for mechanical pursuits. As a result of this decision, the graduates from these courses make few serious mistakes in choosing their careers. They at least serve as a coarse screen to separate boys of mechanical bent from all others. As a rule, these boys, who find themselves in the preparatory class for engi-

neering, either pursue their studies in an engineering college or at once enter upon some mechanical or industrial pursuit.

While it is true that some of the students from type *b* schools enter engineering colleges, it is quite as true that they do so in spite of these schools rather than because they got preparation for the engineering colleges in these schools. Since the engineering college has come into prominence, the manual training schools have naturally considered themselves feeders for the enginering college. As a result, some of the manual training school shop courses, as well as other courses in these schools, have been changed to prepare boys definitely for engineering work. It is not uncommon for a boy to say on entering a manual training high school, "I wish to prepare for ——" (giving the name of an engineering college). If the school has met the demand of such students, it has modified its shop courses, so that for this particular class of students an engineering tone is given to their shopwork. Some schools have even gone so far as to separate into different shop classes those who propose entering engineering colleges and those who intend to leave school with the completion of their high school work.

(*To be concluded.*)

MADE BY STUDENTS IN THROOP ACADAMY, PASADENA, CALIFORNIA.

TWENTY-ONE YEARS OF MANUAL TRAINING.

I.

JAMES PARTON HANEY.

THERE lies before me a dusty and dog-eared Manual of Shop Work with a date of the middle nineties. Alongside of it is a photograph taken a few months since. The manual shows a number of rigid models of the "exercise" type, the photograph is a room fitted as a library and furnished forth with easy chairs, desks, tables, and many books and pictures. There would seem to be very little connection between the "practice exercises" and the room; and, indeed, the relationship is, in genealogical phrase, a bit removed. Nevertheless it exists, and the big chairs are the lineal descendants of their stiff progenitors.

To me book and picture tell a story, pithy as the tale of the paragrapher of the daily press. The Manual represents my first attempt at a work-plan as a supervisor of shops, the photograph an exhibition held some thirteen years later, just before those same shops—increased meanwhile many fold—were turned over to my successor in the elementary schools. Book and picture represent only two brief pages in the lengthy chapter which might be written on the growth of our American practice in the Arts. They fall neither at the beginning nor at the end of the tale, but are what microscopists call cross-sections—bits taken out of the account—serving only to show where the manual subjects stood at two separate moments of the educational history of a city among the first to include the arts in its curriculum. Of all that makes the shadowy filling of the story, the witnesses are mute save to the writer. To him, tho, they speak plainly, and as he studies them, their story lengthens out into one that holds something of the history of the rise of workshops and drawing rooms, more of their development in a great system of schools, but most of the growth of that which came in time to represent a working philosophy.

FIG. 1. ONE OF SEVERAL ROOMS FURNISHED THRUOUT BY PUPILS. SHOWN AT 1909 MANUAL ARTS EXHIBITION, NEW YORK CITY.

A working philosophy is, for the schoolman, as essential as a working library. But it is not so easy to procure. The books may be bought ready made, but the creed of the worker must be a matter partly of growth, of experiment, of study and effort to make at least some elements of an education ideal take shape as classroom realities. To explain this philosopy and something of the things which shaped it is the purpose of this review. One way to do so would be to describe just what the furnished room of the shop exhibition meant in all its relations and its implications. But while the room does in a way epitomize the ideas which brought it into being, like most epitomies, it demands so much in the way of involved explanation, that it will be better to approach the subject directly and lead up to the photograph, instead of working backward from it along a road marked by the hopes, the fears, the little triumphs and the instructive failures of the past twenty-one years.

Manual training is a term I first remember to have heard when as a lad from the grammar school I became a member of the preparatory class of the College of the City of New York. Alfred Compton, beloved of a thousand graduates, was then Professor of Applied Mathematics and the active agent in causing the College to add wood and metalworking shops to its equipment. It was, by the way, this same little professor, the "competent Compton" of his admiring boys, whom I later heard answer an aspiring collegian, who wanted a rule to insure successful post-graduate existence. The reply he received was terse—"Do a thousand dollars' worth of work for five hundred dollars." I've since seen this work well in more cases than one.

By manual training I came to understand that Professor Compton meant work in the newly built shops. Entrance was denied our preparatory class, but with my mates I was permitted to flatten my nose against the windows of the forbidden building, and listen with eager ears to the squeal of the lathes and to my first industrial anthem—the Anvil Chorus. Even had I been older I might, without reproach, have been ignorant of the meaning of "Manual Training." Thus early in the eighties the propaganda of the arts had yet to spread, and one might still count the public manual schools of the country upon the fingers of one hand. Not a decade had elapsed since the Centennial Exhibition. The Washington University of St. Louis, under the stimulus of Professor C. M. Woodward, had but recently established its School of Manual Training, and the Commercial Club of Chicago was still debating the founding of the institution later to be known as the Chicago Manual Training School.

DEMAND FOR THE PRACTICAL IN EDUCATION.

The educational work of the country was at this time experiencing a strong forward movement marked by an insistent demand for more practical forms of schooling. The lessons of the Centennial had fallen on fertile ground and Dr. Runkle of the Massachusetts Institute of Technology had not only adopted for his own institution the suggestion of the Imperial Technical School of Moscow, but was appealing vigorously, in addresses and reports, to the people of Massachusetts on the advantages of the systems of technical training which had been developed in Russian and other foreign schools. But the ultimate cause of interest in the arts lay much deeper than the great fair at Philadelphia. It was rooted in the economic change thru which the country itself was passing. The schools had not as yet outgrown the traditions and the commercial standards erected by a previous generation, but the country, now well over the horrors of the Civil War, was experiencing a huge industrial development. Naturally it made plain its need of skilled workmen by pleading for more practical school training. There were, of course, many schoolmen to resist this "basely utilitarian" trend of education, but a constantly growing element was abroad seeking for forms of motor work which it was hoped would help boys and girls—most of whom would later have to earn a living with their hands—toward, instead of away from, an industrial life.

Not unnaturally the movement gathered force fastest in the larger industrial centers. It was in these that that economic pressure made itself most distinctly felt. The eastern manufacturing cities were first to respond, and in 1886 Boston introduced shopwork into her schools, at the very time that a committee of New York City Board of Education was debating the same question. This committee was for extensive reform. It collected data, published a lengthy report and contemplated revolutionary changes which would have put shops and kitchens in all the schools of the city. Its recommendations, however, were later trimmed to meet the active opposition of many school people who had a lurking suspicion that there was soon to be no more reading, writing, and arithmetic, but instead an orgy of industrialism with the translation of the school system into a training ground for cooks, carpenters, and seamstresses.

It was decided, therefore, to introduce the new studies into half a dozen schools for boys, and the same number for girls, and as success won advocates to let the work grow in response to the demands of

those who wished to be included among the favored ones enjoying the blessings of this new remedy for scholastic and industrial ills,—this very promising pedagogical panacea. My class-mates and myself, having in the meantime served our apprenticeship in the college shops, emerged at this psychological moment prepared to grasp Opportunity

FIG. 2. RECENT SHOP PROJECTS.

by mane and fore-lock, to mount and lead the way to that Promised Land seen—tho somewhat hazily—by every advocate of the training of that which alliteration's artful aid had entitled "Head, Heart and Hand."

CHARACTER OF THE EARLY WORK.

It must be confessed, however, that our ideas of the road to this educational Elysium, were conditioned rather strictly by the course we had ourselves pursued. This had followed in a general way the so-called Russian system, to which Dr. Runkle had called attention at the Centennial, and which had been adopted by the mechanical schools developed by his propaganda. This system was one which laid its chief emphasis on the practice exercise. The joint was its symbol. It was designed for the training of the young engineer, and looked to see the latter made quickly familiar with a variety of processes. Initiative and invention played of course no part in its development. It was planned for a certain end, but this was not the interesting and training of school boys of from ten to fourteen years of age. The schooling of these formed

a very different problem, as we came in time to see. But the merits of "the exercise" were pretty deeply impressed into our mental make-up and in the classroom I found myself destined to go a long way before I saw my own small pupils in the light of teachers, and went to school with them anew to learn how the arts should be taught if they are to capture the interest of the child and lead him to discover something of himself and his capacity to invent and create things.

The manual training course of study introduced in New York in 1888 placed chief emphasis upon the handwork of the upper grades. Cooking was offered to girls and shopwork to boys, while geometrical problems and clay-modeling appeared in the schedule for the intermediate years. Sewing and a little cardboard construction completed the outline. The cooking has since blossomed into Domestic Science, and the sewing into Domestic Art (or it is the other way round), but the shops have remained—at least to their youthful attendants—carpenter shops; and doubtless the present shopman is followed down the street, as I remember myself to have been, by the whisper "there he goes—the carpenter teacher."

Drawing was also a part of the manual course of study, but this was by no means new. The Centennial had served to give a strong impetus to the shop movement, and with its exhibition of the work of the recently created Normal Art School of Massachusetts, had helped in fostering the growth of industrial art. But even before the Exposition buildings rose in Fairmount Park, New York City had introduced drawing into its school curriculum. This was in response to a state law which reflected the interest which five years before had caused Massachusetts to make the subject obligatory thruout her schools.

The drawing required was called "industrial," but gained little from the name. It was largely from books, and little, very little, from models. A few special teachers taught the highest classes in certain favored schools, but in most classrooms the subject fared as best it might, accepted by the majority as an unavoidable evil and developed in mechanical fashion with endless dots and guide lines. Thus there were made a good many copies of "historic"—my associates used to call them "hysteric"—ornaments, and not a few designs of stiff leaves growing from what appeared to be a convoluted bit of gaspipe. Of course none of the latter were actually applied, tho all were given what may be termed courtesy titles: "for wall paper," or "for carpet or oilcloth." By any name they would have been as tame and uninspiring to those that made them.

From 1888 to 1896 the manual training work extended slowly. There was not, it must be confessed, any very avid desire on the part of the school people to share in the blessings of the chosen few, but now and then a new building was equipped with shops and kitchens, or some principal was converted and led to make over some of his classrooms

FIG. 3. RECENT PROBLEMS IN APPLIED DESIGN—PILLOWS AND LAUNDRY BAGS.

into workrooms filled with benches or with ranges and stone-topped tables. These additions increased the original twelve schools until by 1896 some thirty were following the manual training course of study—ten of these having workshops. Not a very vigorous growth for eight years, but it must be remembered that there was little supervision and fostering of the special work save of rather a formal kind by officers not prepared to direct its technical phases. At the same time the course of study, with some rather manifest shortcomings remained unchanged. Propagandists there were, of course, but they found their missionary work slow from the very weight of numbers in the grades. No teacher with a class of fifty pupils longs for exercises with many tools and much manipulation of material.

Meanwhile the development of the arts in other school systems had been marked. In 1890 thirty-seven cities reported some form of manual training included in their curricula, while four years later this had increased to ninety-five. Another six years was to see this number almost doubled. Many of these systems had found the practical models offered

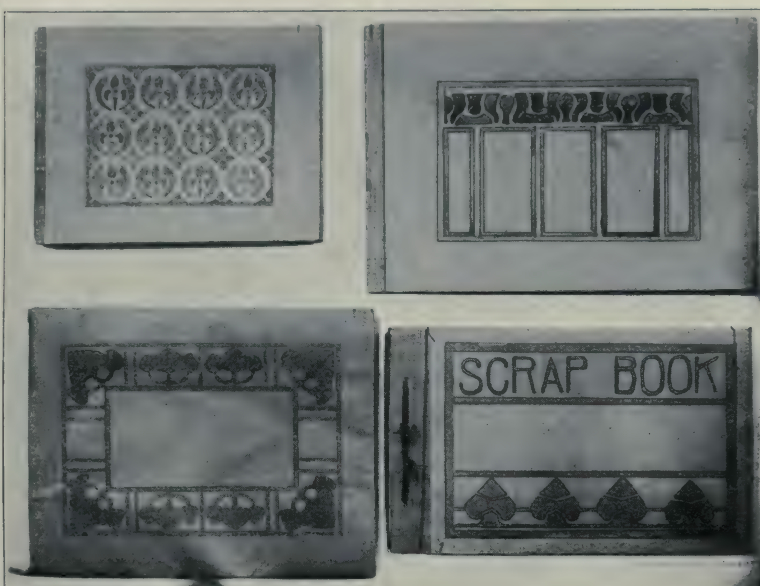


FIG. 4. PORTFOLIOS FROM SEVENTH-YEAR PUPILS.

by the Swedish sloyd more appealing than the joints and tool drills of the Russian system, so that Nääs and its famous teacher had many disciples to urge the sloyder's practice as especially suitable for the grammar schools. The leaven of the arts was working and the manual work as a whole making its way downward as a conviction of the value of motor training spread thruout educational circles. Teachers were coming to see that it was not the shopwork as such that made the handwork valuable, but the opportunity for the child to busy himself constructively as an agent in his own education. Some time was to elapse, however, before the train was to be completed from the high school, and the work of the primary classes made to join neatly with that of the kindergarten.

In 1896 the authorities in New York decided to appoint directors for all of the special subjects—and to me was offered the position of supervisor of manual training. The field to which I was assigned included at first only the thirty schools to which reference has been made, but a School Board enthusiastic on the subject of the arts soon came in,

FIG. 5. BOOKBINDING AND CASE MAKING AND APPLIED DESIGN BY GRAMMAR SCHOOL GIRLS.

and widened this field extensively. I had already made a plea that drawing and design be included in the manual branches. To this the Commissioners agreed, but went further, deciding to revise the curriculum and to do away with the distinction between manual and non-manual schools by requiring some form of handwork thruout all classes and the introduction of shopwork and cooking in the higher grades of every school.

The knowledge of how much latent antagonism this would immediately stir into active opposition, gave me pause in the contemplation of so extensive a program. Not a few scores or even a few hundreds were to be affected by this change, but over 5,000 classrooms were to see familiar forms of work done away with, and new and dreaded subjects

that required time and skill to learn, injected in their place. Small wonder that the daily press soon bristled with letters from "Vox Populi," "Tax Payer," and "Anxious Parent." Especially did we hear from that faithful correspondent and evidently much-tried "Teacher" regarding this new vagary of a senseless School Board. But the senseless ones paid

FIG. 6. DESIGNS FROM HIGHER GRAMMAR GRADES.

small heed. So sharp became the opposition that even I became concerned for the future of my Infant Industry,—and made bold to mention the difficulties of this wholesale change. My only answer was a dry commentary that it certainly would be difficult for a man who couldn't compass it. I therefore said no more but determined to go ahead as long as my official head—which felt perilously loose at times—stayed on.

Twenty assistants were soon appointed to serve as special teachers in the different school districts and as these took their title from my own, they all became special teachers of manual training—a fact most confusing to visitors who associated all things manual with a workshop, and who insisted therefore that these young women must be shop teachers in disguise.

EVIDENT NEED OF GOOD FOUNDATION.

It was, however, apparent to the director after a survey of his expanded field, that what he needed more than deputies was that good working philosophy already adverted to,—a practical creed that would put him in a way to attack the problem of making a course of study which should square with sound educational doctrine. This done, he could with a clear conscience set about converting to this course, the many teachers indifferent or hostile to so unlooked-for an extension of the fads and frills. "Below commerce," says Dr. Mabie, "below wealth and industry, there are a few formative ideas which determine in what spirit the world shall work and for what ends. In this vast activity there are two determinining factors—there are ideals and there is executive power." This indeed was the problem: to make plain the ideals of the arts in the elementary schools, and to settle upon some adequate scheme for their development and supervision.

A good working library might have served as a foundation, but unfortunately there was not very much in the way of literature to aid. Courses of study were to be had from half a hundred cities, but these were of minor service. G. Stanley Hall, Baldwin, Dewey, and Dopp, had yet to publish their clarifying suggestions on the function of the arts in elementary education, while the reviews at hand, Woodward, Runkle, Ham, Seidle, and a dozen more, all dealt with the question from the standpoint of the high school workshop rather than that of the boy who was to be trained from the kindergarten up. Two writers, tho, Götze and Hughes, had seen the matter from other angles—the one from the schoolroom point of view, the other from that of the child. From the "Manual Training Made Serviceable in the School," of the first, and "'Fröbel's Educational Laws" of the second, helpful hints were gained as to the manner of attacking the question. But one thing above all plainly appeared, and that was the necessity of making the analysis personally and at first hand. This it was seen could only come thru constant teaching and ceaseless questioning of class instructors and their pupils.

The one feature which was distinctly novel in the situation was the union of the drawing with the manual or constructive work. To me this seemed the most natural of associations, but teachers of art and shopwork looked askance it. My plea was for a union under a new name. Manual training was misleading, for it apparently excluded drawing

FIG. 7. FURNITURE PROBLEMS IN EIGHTH YEAR.

—the first of all agents in the education of the hand. "Manual Arts" appeared as a more comprehensive term and one that permitted the including of all desirable subjects that psychologists dub "motor." For the "Manual Arts," therefore, I took my stand—one I may say parenthetically, which later developments apparently justified. Both the term and the idea it embodies have since found wide acceptance. This idea, indeed, I made the first tenet in the creed-to-be. It conceived the different topics: drawing, both freehand and mechanical, construction of all kinds, color and design, not as separate subjects, each to be carried on apart from one another, but as "the Arts"—one subject—and as such to be developed. What was wanting in the work of the past was a unity of aim—a practical coordination. This was not to be effected by printed directions in a manual, telling teachers "to correlate." The

direction is easy to give, the thing itself—actual cooperation of the different subjects, difficult, nay impossible, of development, unless the course conceives its different elements as means working to one common end. To secure practical coordination—an actual dovetailing of each topic with the others was then made a basic canon of the creed.

FIG. 8. PART OF MANUAL ARTS EXHIBITION, 1909.

WORK MUST BE BASED ON STUDY OF CHILD.

A study of the kiln-dried exercises in the drawing rooms and shops made plain what should be another Article of Faith. These drawings and models were all the legitimate offspring of "technical-drill" and "disciplinary-value." They consistently enough offered practice for practice's sake. But so far as the product was concerned they were good for nothing from the child's point of view. One really couldn't use the designs for oil-cloths, or the many curious joints; nor could one play with them with any satisfaction. They weren't even good for fun.

In public statements all loyal manual-trainers and faithful devotees of drawing averred that their children loved to make things and to draw,

but in private they confessed that they often had a deal of difficulty in holding their charges to their tasks. Nor was this to be wondered at. In the early kindergarten years—the symbolic stage—you may call a spade almost anything you will—a banner, a target, or a hobby-horse, so please you. But this period is a brief one—and even while they are in it the little folk like to have their imaginary possessions—horses, dolls, and trains of cars, hint at the real thing. Once out they demand much more reality. The wagon they make need not be life-size, but it must be a real wagon, one that will hold things. Use quickly becomes the key to interest. To make things in response to some need the child can understand, is to translate them from the realm of the useless. Real reasons then impel him to aid. A second principle appeared then as imperative—that the arts were to be related to other subjects of the curriculum, were to be made of service and concern themselves with the making of real things, needed things—useful in the school or home.

Further consideration showed that Sully, Lukens, Barnes, Passy, Ricci, and a number of the physiological-psychologists had implications of much moment in their studies of children. Nowhere did the formal courses of the shop and drawing rooms appear less to advantage than when tried by those principles of modern education that deal with the developmental side of child nature. This is the field of all who treat psychology from its genetic side, of all who have come to see that the child in his actions and re-actions, his instincts and his interests, is a constantly changing being, and that in his changes he passes thru several very definite stages of development. The idea that education must be an organic process, dealing with a live and ever altering mind and body, related with peculiar significance to the arts. Here were subjects which used rightly could actually help the child to grow on both mental and motor sides. The older courses had looked to the work; the newer might better look to the worker. The one had been concerned in the making of models, the other might find it wiser to think of the making of boys. Plainly enough the new creed must preach the arts as developmental agents and take care that their practitioners understood both the stages of growth and the means whereby the different subjects could be fitly used to help the pupil thru each stage to the one next higher.

Still another article was drawn from the suggestions of the practical psychologists. These pointed out in rather heavy phrase that "the mind of the individual does not function apart, but in relation to other minds." This is only another way of saying that a good many of our opinions are second-hand, coming from our gregarious habit of flocking together,

FIG. 9. TABLE CONSTRUCTION IN A GRAMMAR SCHOOL SHOP.

swapping experience and then thinking we've thought what we have really only borrowed. This social nature of man is one of much concern to modern pedagogy. We hear a deal of "the group," of "social action," and of the necessity resting upon each subject of the curriculum to show itself as one of "social content." Each must, in other words, make the pupil realize something of the place he holds in the world and of the

FIG. 10. FURNITURE DESIGNED AND MADE FOR A PRINCIPAL'S OFFICE.

part he must play with his fellows in helping to "remold it nearer to the heart's desire." The arts, to square with this injunction, must be made "socializing" as well as developmental; that is, they must continually deal with the life and with the typical processes about the child and must also show how joint action—community effort—helps to get the world's work more effectively done.

Lastly—for only the more important principles may be touched—came the question of material. This was plainly not one to be settled by an *obiter dictum.* As the aim had already appeared, not in the technique

to be learned, but in the changes to be wrought in the youthful technician, the means to this end might indeed be various. The "media" in other words were to be the result of experiment. Clay was to be used if satisfactory from a practical standpoint, wood, yarn, cardboard, iron-tape, also if they served some good and useful purpose. But each must be made to prove its own value and adaptability. The child was not to be made to square with the material, but the material with the child and with the ideas which were to shape his training.

SUMMARY OF THE MANUAL ARTS CREED.

Here then were certain quite fundamental notions as a basis for a working philosophy. It is of course understood that they did not all appear at once complete and sharply defined. But very early in what was to be a campaign of education they shaped themselves with definiteness into a belief which put in a paragraph would practically have stated this: that the arts were to be considered as one subject, to be taught as means not as ends and primarily for their developmental and socializing power; that they should deal directly with use and beauty, and be made by correlation with each other and with other subjects, an intimate part of the curriculum; that they should constantly seek original expression and aim to develop technical skill only in response to a realized need; and that severally and jointly they should aim to sink their identities as "specialties" and reappear as "essentials" so helpful thru their inherent interest and their illustrative power that they would be welcomed by every teacher who came to know their power.

This summary considers the teaching, not the teacher. But as has been noted, ideals need organization and management to make possible even their partial realization. Some further consideration then was necessary to determine those other principles which govern the supervisory side of the work. Here again a few lines must suffice to set forth the result of considerable searching of the Spirit, combined with not a little practical experimentation in plans of organization.

First of all it was plain that the necessary as well as the proper way of developing art was thru the class-teachers and not thru specialists. This meant that with the exception of the constructive work in wood—the shopwork—all other forms of training should be given by the grade instructors and not by teachers coming in once or twice a week. This implied that these class-teachers must themselves be trained in the techniques of the several branches. Cooperative corps work by the assistants

of the supervisor also meant systematic training of the latter in the practice of supervision, while the determination to keep the course of study elastic looked to the devising of some plan for the continued revision and illustration of whatever grade outlines were issued.

Dr. Ross, speaking from experience, says that every art teacher must be a showman. This is truly an axiom of supervision. To the outsider the school exhibition may be thought to have the flavor of a luxury —a bit of personal exploitation, giving a chance to supervisor and supervised to bask in the smiles of enraptured parents who "don't see how you do it." The practically minded supervisor, on the contrary, knows the exhibition as a necessity and one of the most potent of factors in raising standards of all kinds. For this reason it was determined to make the school exhibition an immediate means of placing before teachers the best work done by the best workers, and to use it as a force in educating pupils and parents to the value of the arts. Publicity, we are assured, is an essential in the world of business. The development contemplated had in it certain very business-like aspects, and it was determined that the arts should not fail thru lack of careful and continuous presentation to their ultimate judge—the public at large.

FIG. 11. INDIVIDUAL SOLUTIONS OF A CLASS PROBLEM.

So in brief stood the completed plan. But it is one thing to make such a scheme and quite another to use it. This many a supervisor has come—at times ruefully—to realize. It will be later the purpose to explain something of the practical working out of these ideals with reference to each of the arts. A line may be added also, as to how the teachers themselves fared in the process.

(To be continued.)

FIG. 12. A PIANO-COVER MADE AS A COMMUNAL PROJECT BY EIGHTH-YEAR GIRLS, NEW YORK CITY.

METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, V.[1]

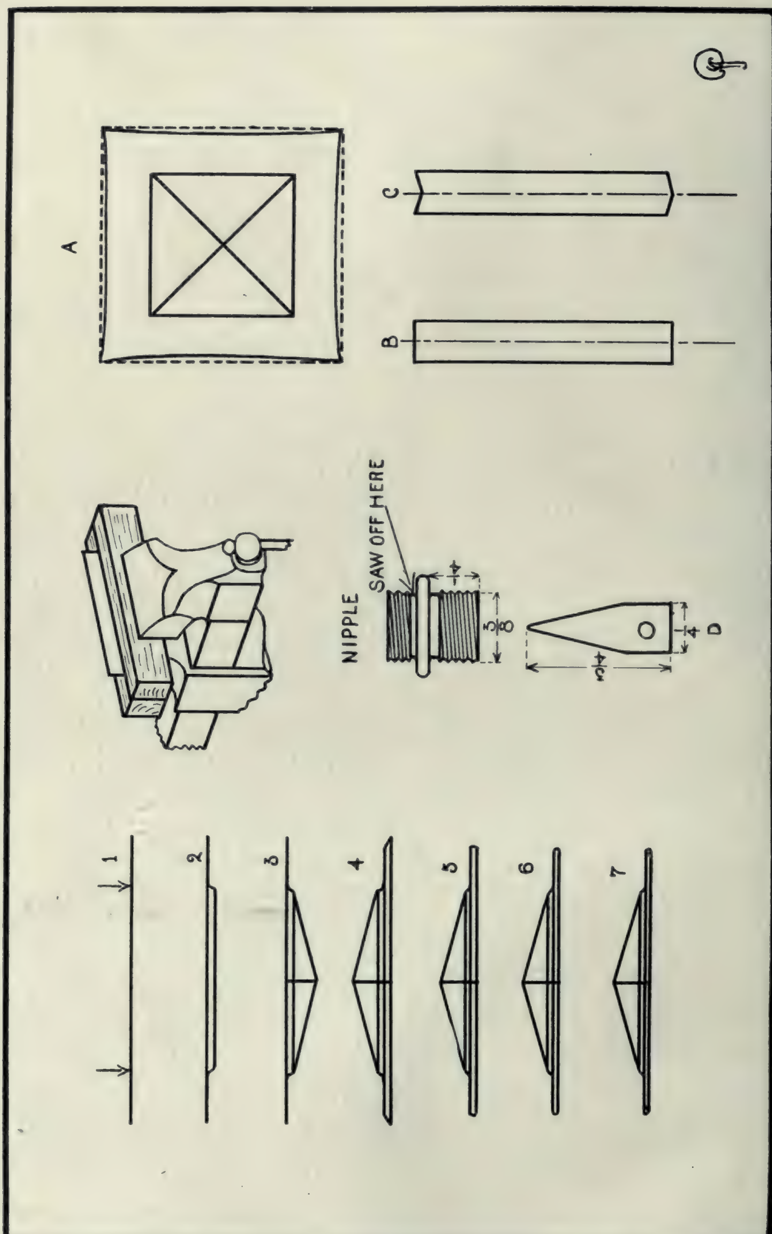
ARTHUR F. PAYNE.

WE PRESENT as the next problem of this series the electric lantern, the construction of which involves straight bending, riveting, and raising, the same as the candle-sticks shown in the last issue.

The photographs show four distinct styles of supports and fastenings for the lantern; some are made to hang from the ceiling, others from the side wall, one is a desk or piano light, another a table light. The construction of the lantern itself is the same in all cases, varying only in the size and design, and the material may be either copper or brass. The parts of the lantern are the handle, top, four corners, four top cross-pieces, four bottom cross-pieces and eight small pieces to hold the glass. The various parts are held together wholly by rivets, a method of construction which makes a strong, durable piece of work and adds greatly to the decorative effect. Soft solder should never be used on work of this kind as it will soon break away, making the work a constant source of annoyance instead of an object of utility and beauty.

It is best to make the top of the lantern first; this is usually from five to seven inches square. Always cut the metal for the top ½″ larger than you wish the finished top to be. This extra ½″ is to allow for squaring and lapping the edge. When the metal is cut to the required size, draw a pencil-line parallel with the edges, where the top will start to be beaten or "raised" upward. The location of this pencil line is indicated by the arrows on the drawing No. 1.

With the neck hammer beat down the metal over the edge of a block of wood held in the vise in exactly the same method as shown for the match-holder base in the drawing on page 171 in the December issue. The progressive steps for the "raising" of the lantern-top are shown in the drawing accompanying this article. No. 1 is the flat piece of metal cut ½″ larger than the finished top. No. 2 is the way it should look after beating it over the edge of the block with the neck hammer.


A
B
C
NIPPLE
SAW OFF HERE
D
1
2
3
4
5
6
7

It is probable that the edge will at this time bend slightly out of shape; if it does, place the top on a flat piece of wood and flatten the edge with the wooden mallet. To proceed to No. 3, draw pencil-lines from corner to corner on the inside of the bottom of No. 2, intersecting at the center. Procure a block of hard wood (maple is best, but oak will do) 3″ square and 7″ long, and with a gouge cut a depression in one end

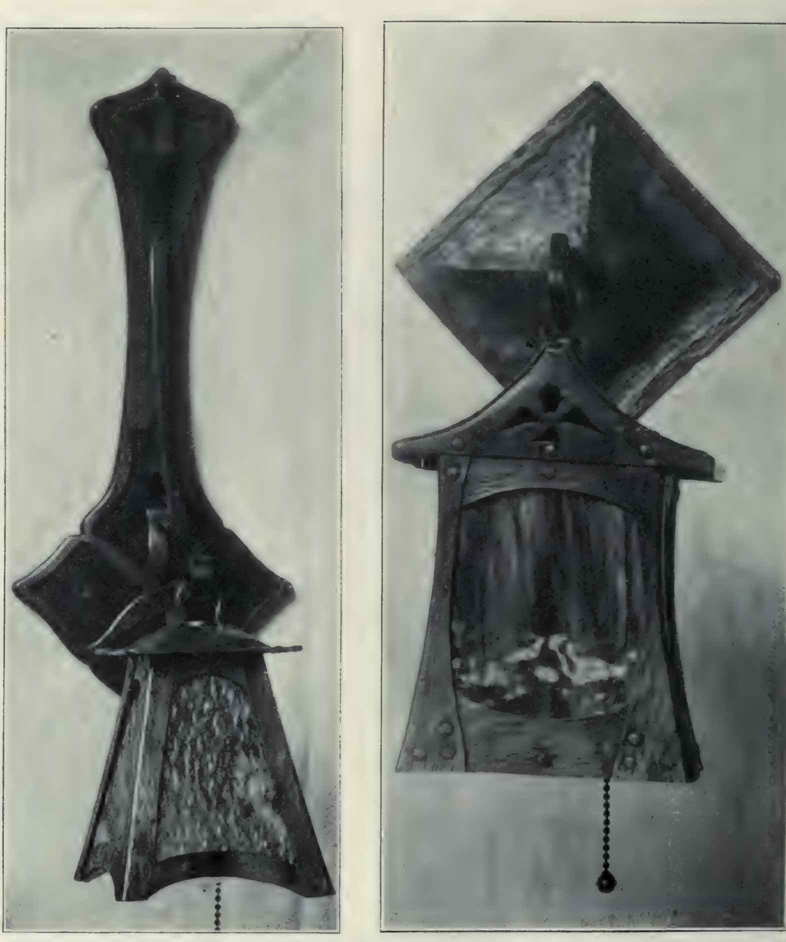
LANTERNS.

about ½″ deep. Fasten the block in the vise, hold the lantern-top over the depression, and with the neck hammer beat the metal along the pencil-lines, hammering a little harder in the center where the lines intersect, being careful to hammer only on the pencil-lines. This will make the top look like No. 3. Care must be taken during this process to keep the lines square and straight. If it is desired to raise the lantern-top to a high sharp peak it will be necessary to raise it part way and then "anneal" it, by the process which was fully described on page 170 in the December issue.

After the top has been made like No. 3 it will be found that the sides have been drawn in by the hammering, as shown in the sketch marked A. It will, of course, be necessary to straighten the sides by cutting with the shears, and then we may proceed to lap the edges as shown in Nos. 4, 5, 6, and 7, altho it is not always necessary to carry this process thru Nos. 5, 6, and 7. If we turn the edges down as in No. 4 it will be satisfactory in most cases. Some of the lanterns shown in the photographs were finished like No. 4, but if it is desired to carry the lapping

process thru to No. 7, the process is exactly like that described for the book-ends in a previous article.

After the top is raised to the desired height and the edge finished it will be necessary to hammer it all over with one of the hammers on either



LANTERNS.

the 157 lapping-stake or the 155 smoothing-stake illustrated in the June, 1910, issue. This final hammering, besides offering an opportunity to square and true the work, stiffens and hardens the metal, and covers the

surface with hammer marks which add greatly to the charm of the finished piece of work if it is carefully done. This process is known among professional metal workers as "planishing," and the process of beating and hammering the flat metal into shape is known as "raising."

LANTERNS WITH GLASS REMOVED.

These terms will be used hereafter in this series to distinguish one process from another. The term planishing meant to the metal workers of years ago the process of smoothing and stiffening the metal by hammering it carefully with the smooth flat face of a planishing hammer. In our case it would be with the flat face of the ball pein hammer. Within the last few years the custom of hammering the metal with the ball end of the hammer and with the neck hammer has also been called planishing. All these methods were used on the lanterns shown in the photographs and may readily be distinguished by the long narrow marks of the neck hammer, the small distinct round marks of the ball end of the hammer, and the smooth, almost invisible, marks of the real planishing with the flat end of the hammer. To a beginner the easiest would be to planish with the neck hammer or the ball end of the ball pein hammer.

Now the lantern-top is ready for the hole thru which the electric wires pass. This hole should be ⅜″ in diameter and may be bored thru with a drill or may be sawn out with the saw-frame used on the drawer-pulls and hinges and illustrated on page 52 of the October, 1910, issue.

The hole is made ⅜″ in diameter because that is the size of the small brass nipple that we shall use to hold the electric socket in the lantern. These nipples cost five cents each and may be obtained from any dealer in electric supplies. There is a thread on both ends, but as only one is necessary the other may be sawn and filed off as indicated in the drawing.

TABLE LAMP AND DESK ACCESSORIES.

It is now necessary to make the handle and rivet it on the lantern-top. This handle may be made of round wire flattened at both ends to allow of riveting, or it may be made of a strip of flat metal cut out and bent to shape. When riveting the handle to the lantern-top have the head of the rivet on the outside. These rivets are known as oval head rivets,—the term oval applying to the cross-section view of the head which is half oval. The heads of the rivets used on the lanterns in the photographs were $\frac{3}{16}''$ and $\frac{1}{4}''$ in diameter. They are known as No. 12 trunk rivets, and may be obtained at almost any hardware store.

LANTERN.

After the handle is fastened to the top, cut a paper pattern for the corner pieces. If the lantern is to be the same size at the bottom as it is at the top the pattern will look like B in the drawing, but if it is to be wider at the bottom than at the top the pattern will look like C in the drawing. Cut out the corners from the flat metal and planish them with the same hammer that you planished the top. If they get very hard from the planishing, soften them by "annealing." Then draw a pencil-line down the center where they are to be bent at right angles. To bend the corners, get two pieces of hard wood about 10″ long x 1″ thick x 2″ wide and place the copper between the pieces of wood so that the center-line comes exactly to the edge of the wood as illustrated in the sketch. Fasten in the vise, and with the mallet carefully and smoothly hammer over at right angles the part that projects above the wood.

In making the paper pattern of the top cross-piece allow $\frac{1}{4}''$ extra metal along the edge that goes next to the top for the purpose of riveting the body of the lantern to the lantern-top. Planish the cross-pieces to match the top and corners, and bend the extra $\frac{1}{4}''$ over at right angles between the two pieces of wood as before. Cut out and planish the bottom pieces.

LANTERNS AND TABLE LAMP.

The photographs show a rivet in the center of each bottom and top cross-piece. The purpose of this rivet is to hold a small piece of sheet copper the shape and size of D in the drawing. These pieces may be seen in the photographs at the bottom of the lanterns that have no glass in them.

DESK OR PIANO LANTERN.

After the lantern is colored and finished this small piece of copper is bent over onto the glass holding the glass in place. It is better to cut out and rivet these pieces on the cross-pieces before the cross-pieces are riveted to the corner pieces. Next locate and drill the holes in all the pieces excepting the top and rivet the lantern together. Then place the top in position, mark and drill the holes, and rivet the top on to the lantern and it is ready for coloring and finishing.

For finishing the lantern I shall describe a new process, that of waxing. This finish is much better for the larger pieces than banana oil. The wax finish is prepared and used in the following manner: In a tin cup melt some beeswax; when it is liquid move away from the fire and pour in an equal amount of turpentine, stir together and set aside to cool. Color the lantern by any of the previously described methods of coloring, or polish as bright as possible with the steel wool or emery cloth and leave

bright. After the desired color is secured, warm the lantern over the bunsen burner, or any other flame that will not smoke, and with a small piece of cloth rub on the lantern a small amount of the wax. The lantern must be warm enough to melt the turpentine and beeswax as it is applied, but not hot enough to cause the wax to smoke. After the wax has been rubbed lightly and rapidly over the lantern allow it to get perfectly cold, then polish briskly but lightly with a soft, clean cloth. The finish gives a soft sheen to the metal that preserves the color indefinitely and adds materially to the beauty of the finished article. It remains only to put in the glass and bend over the glass holders and the lantern is finished.

(*To be continued.*)

FIG. 107. WORKSHOP, STRASBURG TECHNICAL SCHOOL.

VISITING MANUAL TRAINING SCHOOLS IN EUROPE.

CHARLES A. BENNETT.

VIII.—STRASBURG.

AFTER a day's journey by fast train from Paris, I reached Strasburg early in the evening. One cannot be in this capital city of Alsace-Lorraine very long without realizing that it is a strong military post. Every fifth man you meet is a soldier, and in some parts of the city there are times, especially in the evening, when every second man wears the garb of the German army. Fifteen thousand troops are quartered in Strasburg, and they seem alert enough to make good the claim that if war were to be declared with France in the evening, ten thousand of them would be on French soil by morning.

But interesting as were the soldiers, the narrow streets and the quaint timber-roof houses in the older part of the city were far more so. As I walked along some of these streets on that first, crisp, January evening, meeting the happy people as they hurried along, catching snatches of German songs here and there, and glimpses of picturesque corners, doorways, windows, and overhanging roofs, the poetry and charm of it all delighted me. I gave myself up to the enjoyment of it so fully that my sense of direction forsook me, and after I had wandered for an hour or more under its spell, I found that I was entirely lost. From the cathedral

I had gone in the wrong direction. It took miles of walking to get back to my hotel, but I expressed no regret. I should like to be lost again in this same old city on just such a fine winter evening.

Early on the following morning, accompanied by a guide, I started out with a letter of introduction which had been secured for me by the United States Ambassador at Berlin. From the highest state official we were sent to the highest city official, Dr. Albrecht, who, in turn, gave us a letter of introduction to Inspector Motz, the director of the work in manual training.

THE TECHNICAL SCHOOL.

While waiting for Dr. Albrecht, we were advised to call on Dr. Hermann Fecht, ministerial director of technical schools, who gave us a cordial welcome and a card of introduction to the principal of the Strasburg technical school. Soon after reaching the school we met Professor Hey, head of the department of mechanical engineering and director of the shopwork, who conducted us thru the school. The shopwork of the school is done by the boys of the two-year preparatory course. In this course they spend all their time in the shops except one day a week, when they receive four hours of instruction in drawing, two in mathematics and two in language and other branches more or less closely connected with the shopwork. There were thirty boys in this preparatory class.

From the allotment of time it was evident that this preparatory class was in reality an apprenticeship school, the boys doing their shopwork here instead of in commercial shops. Further investigation revealed the fact that the time allotment was identical with that of the continuation schools of Strasburg, and that the subjects of study were the same as in the machinists' course in the continuation schools. Thus the preparatory course in the technical school was based on the continuation school, the difference being in the fact that the boys in the preparatory course cover in two years the entire ground of the three years of apprenticeship. Professor Hey emphasized the advantage of the preparatory course over the usual apprenticeship, and pointed out that one great gain was in the more systematic and thoro instruction in the shopwork.

The shop building, Fig. 107, is of saw-tooth construction. It consists of one large room and a small office near the door.

The blue-prints used in the school workshop were from drawings made by students in the technical school—not by the preparatory pupils who were doing the shopwork. Each shopwork pupil, however, kept

a work-book in which were notes and sketches and the time spent on each class or piece of work. The shopwork course begins with chipping and filing wrought iron. The five exercise pieces, shown in Fig. 108, are required of each pupil, and in the order given. When a boy finishes

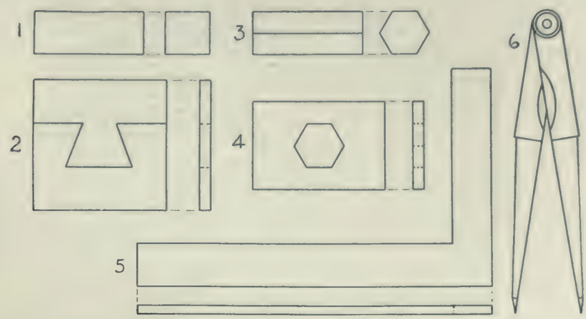


FIG. 108. CHIPPING AND FILING COURSE, STRASBURG TECHNICAL SCHOOL.

these, he is assigned to the forge, which, with two anvils, is in the far corner of the room, or to one of the pattern-making benches which occupy another corner of the same room. All boys must eventually take both of these kinds of work. In each they stay eight or ten weeks, and then spend the remainder of the two years in machine-shop work.

The forging course was substantially as follows: (1) Drawing out a piece of iron to a point, (2) bending a square corner, (3) a split weld, using round iron about one inch in diameter, (4) machine-bolt, (5) lap weld, (6) lathe-tool, (7) blacksmith's chisel, (8) hammer, (9) tongs, (10) chain. In the pattern shop only a few exercises in woodworking are given before patterns are made, and the patterns made are those needed in the building of machines in the shop. No course of formal exercises is given in the machine-shop work, but the foreman makes sure that each boy has experience in all the fundamental operations. For example, if fifty special screws are needed, instead of having one boy make them, or having them made on a screw machine, each boy makes a few on the lathe. On the other hand, the general aim is to give the work in as practical form as possible, and under conditions and in the order that approximate the commercial shop. Among the machines constructed I saw a boring-mill, lathes, crank-shaper, drill-press, and many models to illustrate mechanical motions and mechanism. Emphasis was placed on the fact that each boy must make his own tools and keep them in repair.

Not only the work, but the methods also approximate, or imitate, the commercial shop. All of the instruction is individual. The method is

just as near as possible to that of apprenticeship, which is considered the ideal. Not even demonstrations to groups of three or four students are given. All instruction is given by the foreman of the shop who uses as

FIG. 109. BUILDING TO ILLUSTRATE BRICK AND STONE MASONRY.

assistants the boys who are most advanced in their work. I saw a boy who had been working on the large eighteen-inch lathe for three months helping another boy who had been there only eight days; he was showing him how to cut a screw thread. Similarly in the forge corner of the room, I saw one boy showing another boy how to make a lap weld. Professor Hey considers this system very satisfactory.

The foreman was not a technical school graduate, but a selected journeyman who had served his apprenticeship and later passed thru an extended and varied experience. It was evident, too, from the work done and from the emphasis given to the different parts, that he was a machinist. The machine work was much better done than the pattern work. There was no foundry work. Professor Hey did not want a foundry because he thought it would be impossible for the boys to make good castings in iron; he preferred to send his patterns to a commercial foundry.

As we returned to the main building, I took a snap-shot of a small structure in the rear, Fig. 109. This building was made to illustrate the different forms of brick and stone construction—especially in windows and door openings, there being no two alike in the structure. It is used by classes studying architecture.

MANUAL TRAINING IN THE ELEMENTARY SCHOOLS.

Late in the afternoon we called at the office of Inspector Motz, and were almost immediately taken by him to a manual training center only a short distance away, where pupils were at work. All manual training work in the elementary schools of Strasburg was done outside of the regular school hours; and a most interesting thing about this fact was that the inspector seemed quite content to have it so. He said there was not time enough for it in the regular school hours, and that his recent visits to two other cities in Germany, where it had been tried in the regular hours, had convinced him that it was not practical to put it in the regular school time.

Boys in Strasburg are given three hours of manual training a week—an hour and a half, from 5:00 to 6:30 on two days. Some of them, however, take it on Wednesday and Saturday afternoons when there are no regular sessions of the schools. With this time schedule it is possible for the instruction to be given by the teachers of the other school subjects, but in order to be appointed for such work, teachers are obliged to qualify in manual training, by taking a holiday course at Leipsic or otherwise, and for this extra service they are paid at the rate of sixty-two and one-half cents an hour. Instruction is free to elementary school pupils, but students from higher schools pay a nominal tuition fee.

At the center visited we saw a class in benchwork in wood and a class in wood-turning. There were two workshops and two teachers. That particular evening there were perhaps eight boys in benchwork and five or six in turning. The benches were old and badly worn. The lathes were run by foot power and showed marks of long use. The teacher of the benchwork was a grammar grade teacher who had studied at Leipsic; the wood-turning teacher was an expert craftsman who came to the school to teach his specialty.

In a room adjoining the shops was a collection of completed models from the several manual training workshops of the city. Here I saw the models representing the course of instruction. Figs. 110 and 111, reproduced from *Vorlagen für den Handfertigkeits-Unterricht,* published by Ludolph Beust, Strasburg, show the first half of the models of the course in benchwork. The later ones are joints, some of which are immediately followed by applications in useful models. Figs. 112 and 113 show the first forty models of the quite remarkable course in wood-turning.

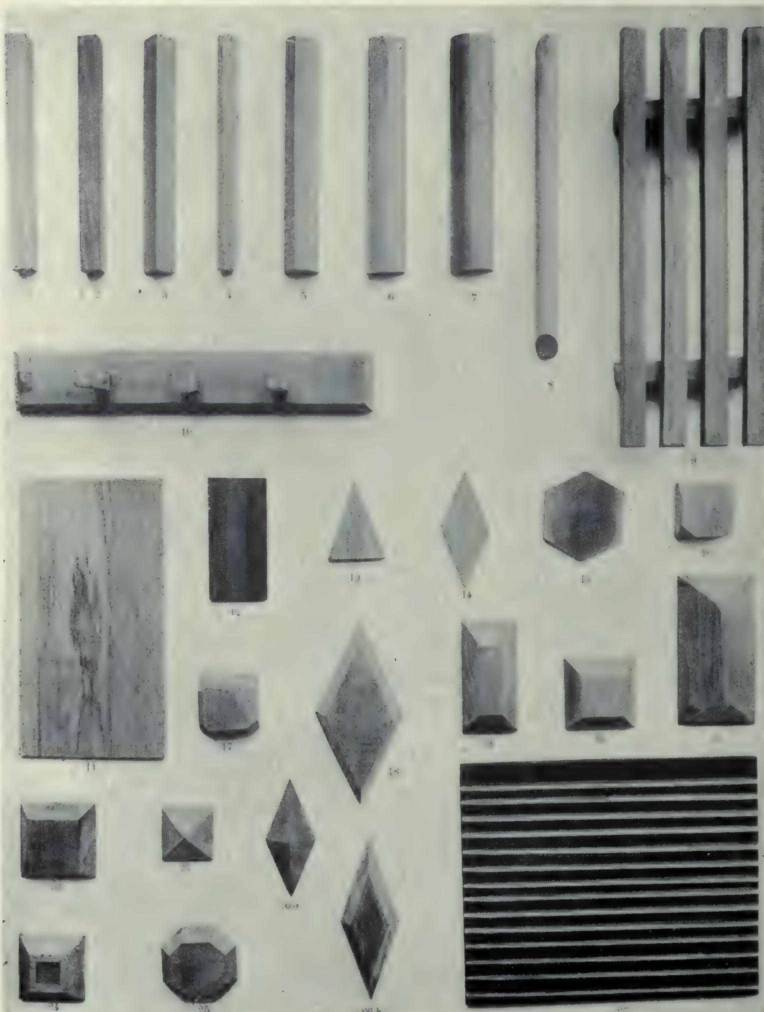


FIG. 110. FIRST EXERCISES IN WOODWORKING COURSE, STRASBURG.

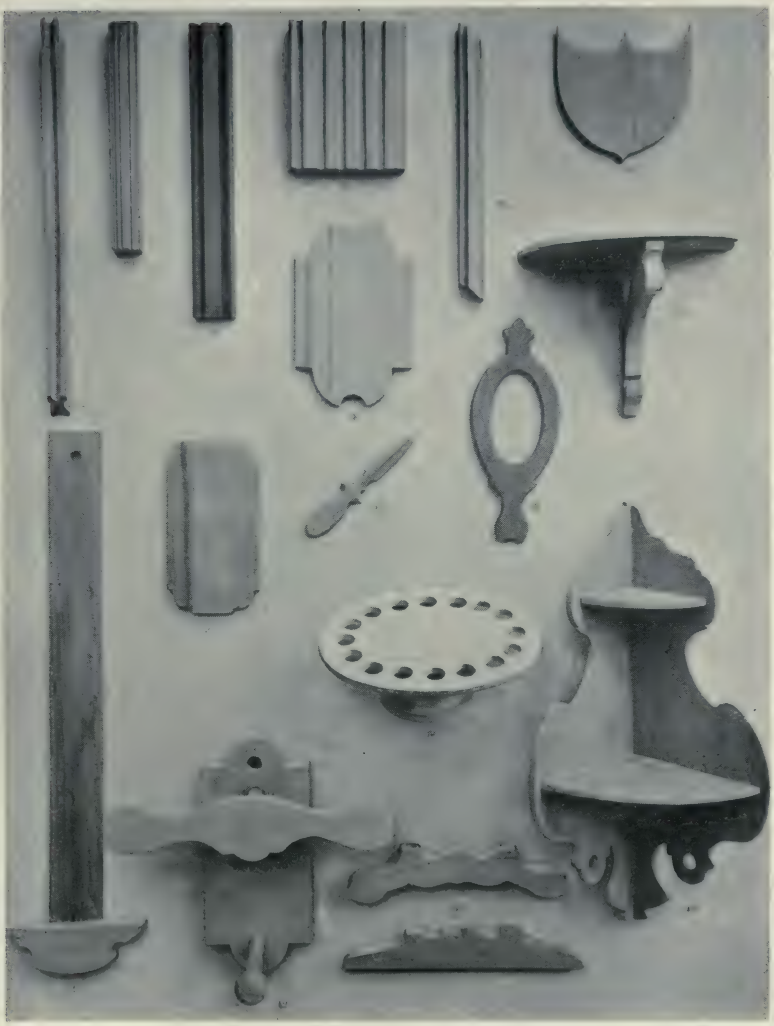


FIG. 111. EXERCISES IN WOODWORKING, STRASBURG.

FIG. 112. EXERCISES IN WOOD-TURNING, STRASBURG.

FIG. 113. EXERCISES IN WOOD-TURNING, STRASBURG.

TYPICAL SCHOOLS.

The next morning we went to the Thomas school, where we received a hearty welcome, Fig. 114. Before we reached the inside of the building we found Inspector Motz there ready to receive us. This is one of the finest school buildings in the city and is used for a teachers' training school and a model school. We were first ushered into a large corner room with rows of seats on the two adjacent sides next to the windows, the remainder of the space being left free from furniture. In this room we found the kindergarten. On one side were seated a group of eight children knitting. Near the corner of the room was another group of eight four-year-olds. On the desks in front of them were building blocks in boxes. The children were asked what they received for Christmas, and were required to answer, one at a time, enunciating with apparent effort. After a few minutes of this language work the attention of the pupils was turned to the building blocks and the teacher asked, "Who made the building blocks?" The reply came, "The carpenter made the building blocks." Then the teacher asked, "What are you going to build?" To this the pupils answered, "I am going to build a sledge." "I am going to build a standing clock," etc., according to the individual child's intent. Then the building began.

FIG. 114. GOOD MORNING.

Just back of these children was a group of three-year-olds, who began to sing a song and make gestures representing a railway train; and this is what they sang: "I am going to America to visit a rich uncle and aunt." It was, indeed, a nice compliment to the American visitor and was thoroly enjoyed by all.

On some of the desks in the room was an exhibit, neatly arranged, showing the paper folding work done by the children. On a portable blackboard was a drawing of a Christmas tree in colored crayons. In

an alcove at the corner of the room was a group of four or five little beds for children who may not be well or may be in need of rest during the long school day.

In the adjoining room were pupils of the next higher grade. When we entered they were singing and acting the story of a fox that was being shot by a man with a gun. On the desks an exhibit of handwork

FIG. 115.—COOKING ROOM, STRASBURG.

was spread out for my inspection—work with lentils, sticks, paper, and several other materials. In both of these rooms there was ample floor space, pleasing wall decorations, good pictures and numerous evidences of high educational ideals and thoro work, but the handwork seemed very formal.

From the Thomas school, accompanied by Inspector Motz, we went to visit a school in Königshofen, just outside the fortifications of the city. This was a new building, architecturally interesting and representing the most modern thought in elementary school work in Strasburg. Here we met Principal Weyhaupt, who conducted us thru the building and did everything possible to make our visit profitable. The first room entered was an ample gymnasium, built as a wing of the main building

and receiving light from two opposite sides. With low platform and desk at one end, it suggested a chapel, and we learned that on special occasions it is used as an assembly room for the pupils. An excellent bath room was provided. This was essentially one shower bath large enough for a class of perhaps thirty, arranged in four or five rows.

FIG. 116. TABLE AND STOOLS FOR SIX PUPILS, COOKING ROOM, STRASBURG.

Near the door were valves controlling the flow of water and an hour glass, so arranged as to indicate the length of time the hot water should be turned on, when cold should take its place, and the time allowed for dressing. The entire bath of a class, regulated by this glass, takes no more than twelve or fifteen minutes. Each pupil is required to take such a bath once in two weeks. The city pays for towels, soap, etc.

From the gymnasium we went to the cooking room which seemed to be admirably equipped. Fig. 115 shows the tile floor and the arrangement of stoves and tables. Fig. 116 shows one of the tables with the six accompanying stools, also the teacher's desk and a part of the portable blackboard. The twenty-four students of a class are divided into four groups of six, and each group occupies a table and a stove; they cooperate as a family in working out a given problem. I was told that there were

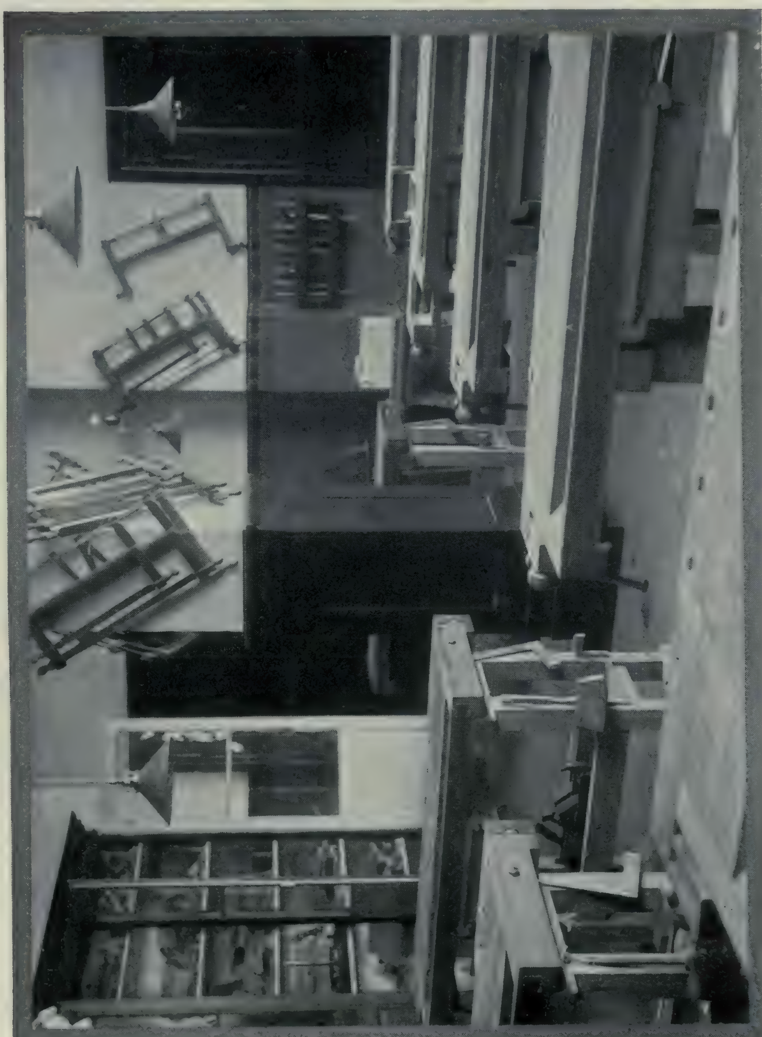


FIG. 117. WOODWORKING SHOP, STRASBURG.

no individual problems given. Of course I was much interested in the design of the tables and the fine workmanship they displayed. At the side of the room in front of large windows were two sinks with long draining boards at each end and closets underneath.

The shops in this school were equally interesting in their equipment, representing as they did the latest ideas in the mind of the inspector.

FIG. 118. TOOL CLOSET, WOODWORKING SHOP, STRASBURG.

There were three shops, one for metal, which was not yet equipped, one for benchwork in wood, and one for wood-carving. The wood-working shop is represented in Fig. 117. The illustration clearly shows the benches to be of the cabinet-maker type, very strong and considerably larger than most of the benches used in grammar grades, or even high schools in America. At the far end of the room, in front of the pier, is a flat grindstone such as I found in general use in Strasburg. The saws used are those hung on the walls of the room. The Germans seem not to know the convenience of our American handsaws. At the opposite

end of the room, but not shown in the illustration, was an electric glue heater—the first I had ever seen in a manual training shop. Fig. 118 shows how the finer tools were arranged in a case on one side of the room. Among these tools I noticed several that were new to me. One was a heavy knife, Fig. 119, with a handle about fifteen inches long, so that the end of it could rest on one's shoulder when in use. It

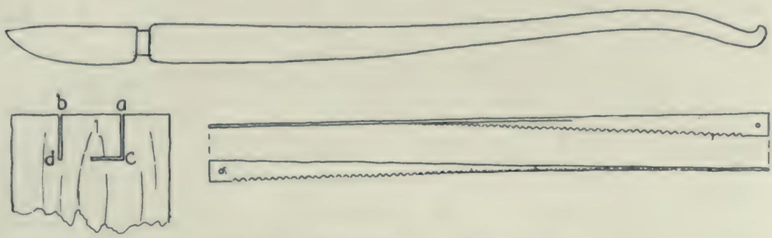


FIG. 119. SPECIAL TOOLS, STRASBURG.

was used for cutting the sides of dovetailed grooves across the grain, as, for instance, in a bracket shelf when the top of the bracket is set into a dovetailed groove in the underside of the shelf. After this cutting on the sides has been done with this knife, the surplus stock is taken out with a chisel and router.

The most remarkable tool in the case was a saw-blade that would cut a square corner without turning. This is shown in Fig. 119. It is bent at right angles in such a way that with one end of the blade you can saw vertically downward, and with the other end horizontally across without changing the angle of your saw frame. To illustrate, suppose we wish to cut a rectangular piece *a b d c,* Fig. 119, out of the end of the board. First saw down *b d* with the far end of your saw blade; then saw down *a c* with the same end. When the point *a* is reached, push the saw forward past the middle and it will begin to cut horizontally. Continue sawing, using the near end of the blade only and the point *d* will soon be reached. The application and convenience of such a saw is obvious. I understood that this saw had been invented by the teacher of manual training in this school.

Several other tools were different in proportion or construction or design from those in use in America. There were no adjustable planes, but there was a large variety of shapes and sizes of the non-adjustable kind. The chisels were heavier than ours. The sliding bevel had no set-screw or device of any kind for fastening the blade in position, it being held sufficiently by friction of the parts. The gages were double

and very heavy. Wooden U-shaped clamps, similar in form to some of our small iron clamps, took the place of handscrews, the corners of the U-shaped frame being made with lock joints.

In the wood-carving room, Fig. 120, there were two large heavy tables adjustable for height, and about twenty three-legged stools. Work

FIG. 120. CORNER OF WOOD-CARVING ROOM, STRASBURG.

was held in place on the top of the bench by small iron clamps let down thru holes in the top and catching on the under side of the bench top.

At five o'clock we were at the St. Joseph School, where we were met by Principal Heidmann, who took us to see classes in locksmith work, ornamental iron work and wood-carving. The locksmith shop was a small building, perhaps sixteen by twenty-two feet, in the school yard. On each of three sides was a long bench against the wall, and to these were attached heavy post vises about three and one-half feet apart. I believe I counted sixteen vises in the room, and there were about a dozen boys at work. At one end was a small stove, and nearby a forge, which the principal said they did not use. The boys were filing blocks of wrought iron with large files that were none too sharp. The first

thirty-seven of the fifty exercises in the course of instruction are shown in Figs. 121 and 122. The remaining exercises are for the most part ornamental escutcheons. The final piece of the course was an iron chest representing a large amount of good work; the decorative clasps and hinges and the lock were all made by the boys.

But in all this there seemed to be no effort to teach design. In America we would have expected each pupil to design his box, thus giving individuality to his work and affording him an opportunity to connect design with handwork, but this seemed to be no part of the plan in Strasburg. There such a plan would, perhaps, be looked upon as impossible because the work is done by such young boys, and because the teacher is a master locksmith, not a school teacher, nor a teacher of design. He works at his trade each day up to the hour of his class.

From the locksmith shop we went to the shop where ornamental iron work is taught. This was a small room with a long bench on one side and another long bench thru the middle. Iron about a millimeter thick was being formed into rosettes of numerous patterns and even into naturalistic sprays of roses. Figs. 123 and 124 show a part of the course of instruction. The raising of the first of these forms was done by hammering a disc of metal placed over the end of a pipe coupling which was screwed to a short piece of pipe and held vertically in an iron vise. The hammering was done with a ball-faced hammer. The size of the coupling was suited to the size of the piece being worked. Stakes were also used, for the hammering was done on both sides of the metal. A flat pattern for each piece in each model of the course had been perfectly cut out of metal by the instructor. When a boy was ready to make any particular rosette he went to the instructor, who gave him the patterns for this rosette. Placing them in turn upon a sheet of the metal he would mark around them with a scriber. Then he would cut and file out these forms, and later raise them like the model. The patterns belonging to a given rosette were strung on a string or wire and hung up high in the room. Pressed oak leaves, in one case, were being used as patterns, but the rose seemed the favorite natural form for the most advanced work. In this connection it should be remembered that such ornamental iron work is very common in southern Germany, being used extensively on doors, gates, stairways and elsewhere. For that reason it has a significance there which it would not have if done in America.

The instruction in this, as in all the metalwork I saw in Strasburg, was entirely individual, and the classes were small. The teacher was an expert craftsman.

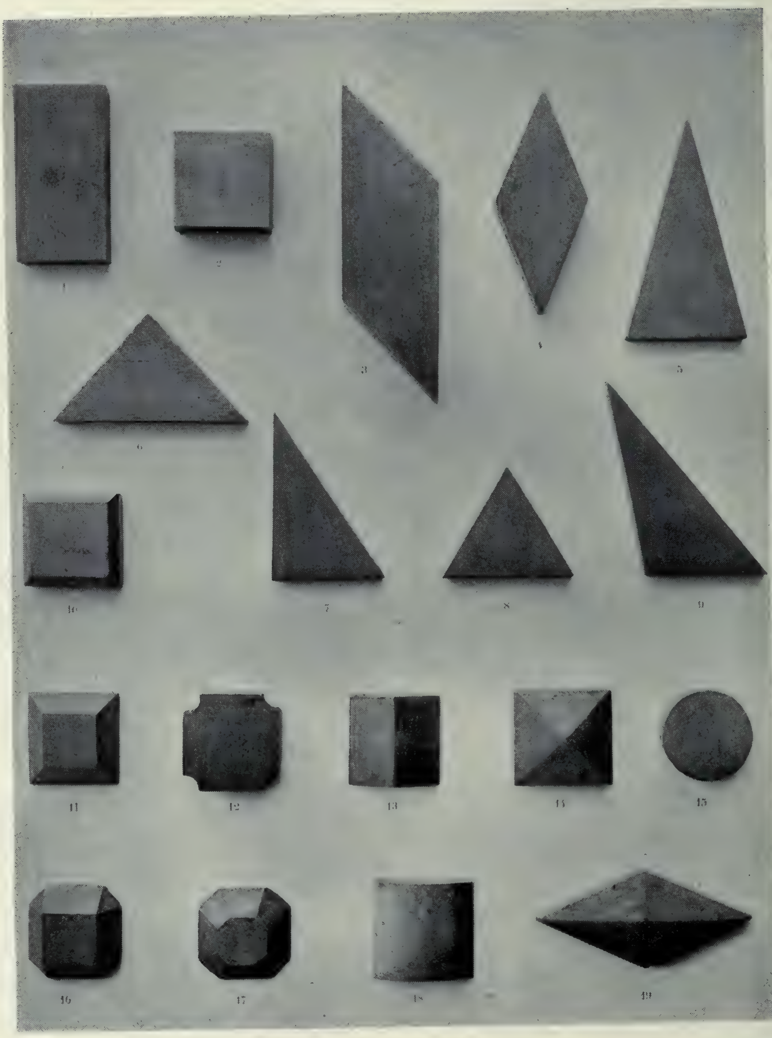


FIG. 121. FIRST EXERCISES IN COURSE IN LOCKSMITH WORK, STRASBURG.

FIG. 122. EXERCISES IN LOCKSMITH WORK, STRASBURG.

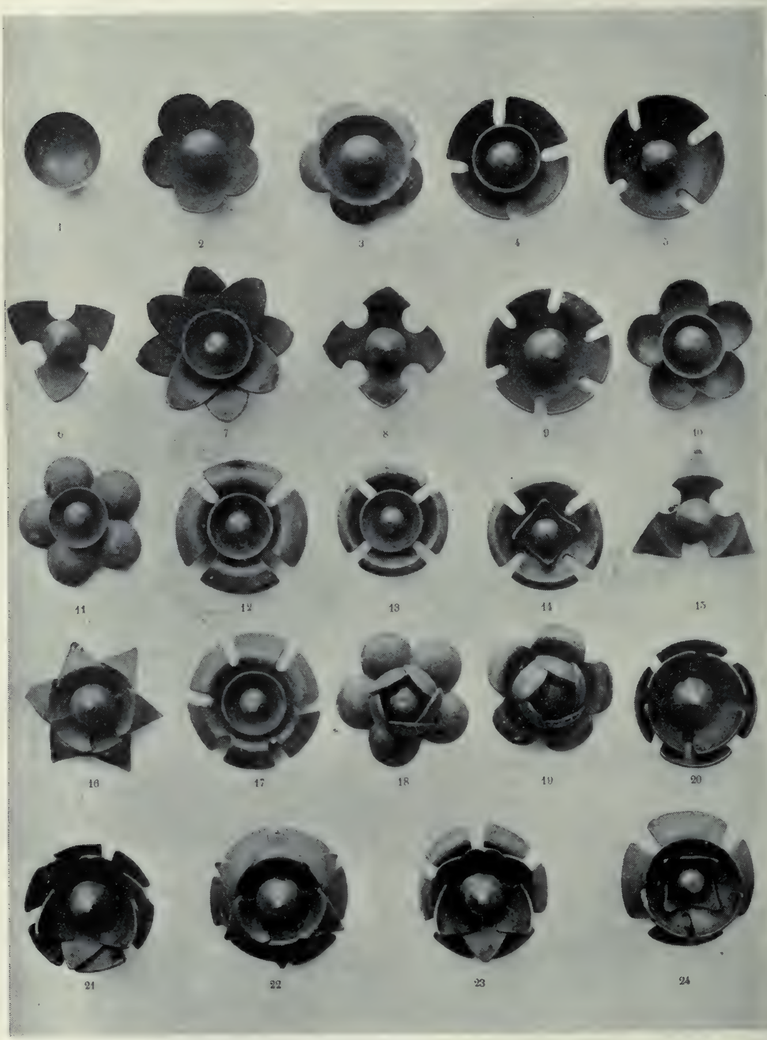


FIG. 123. BEGINNING OF COURSE IN ORNAMENTAL IRON WORK, STRASBURG.

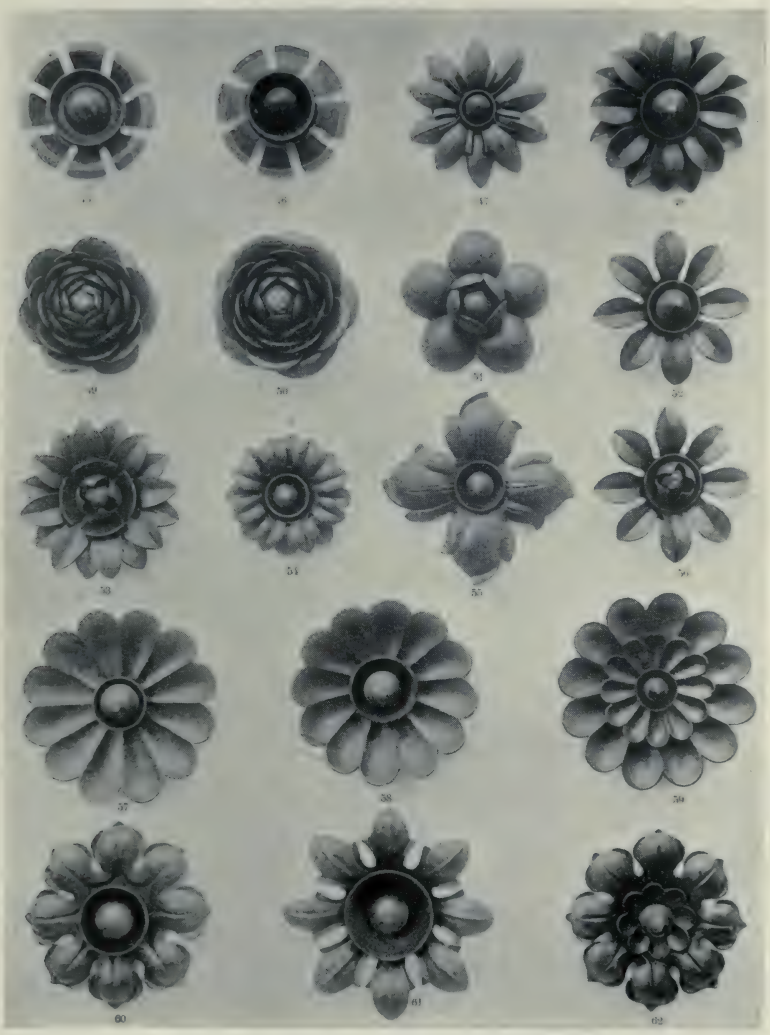


FIG. 124. ORNAMENTAL IRON WORK, STRASBURG.

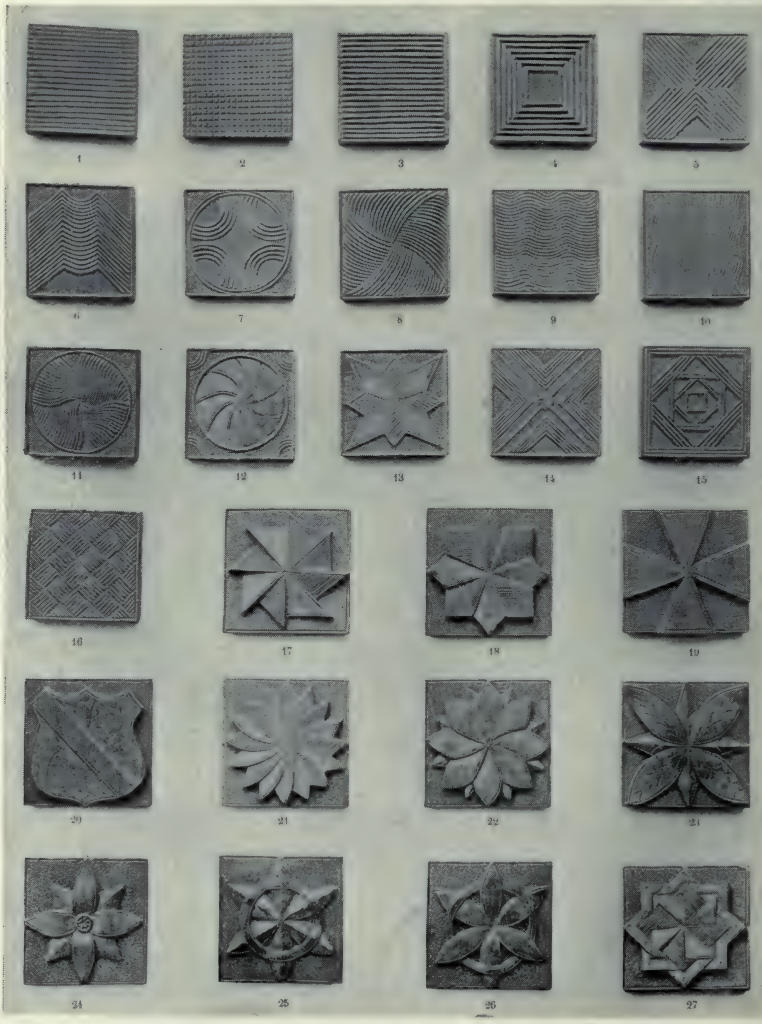


FIG. 125. BEGINNING OF COURSE IN WOOD-CARVING, STRASBURG.

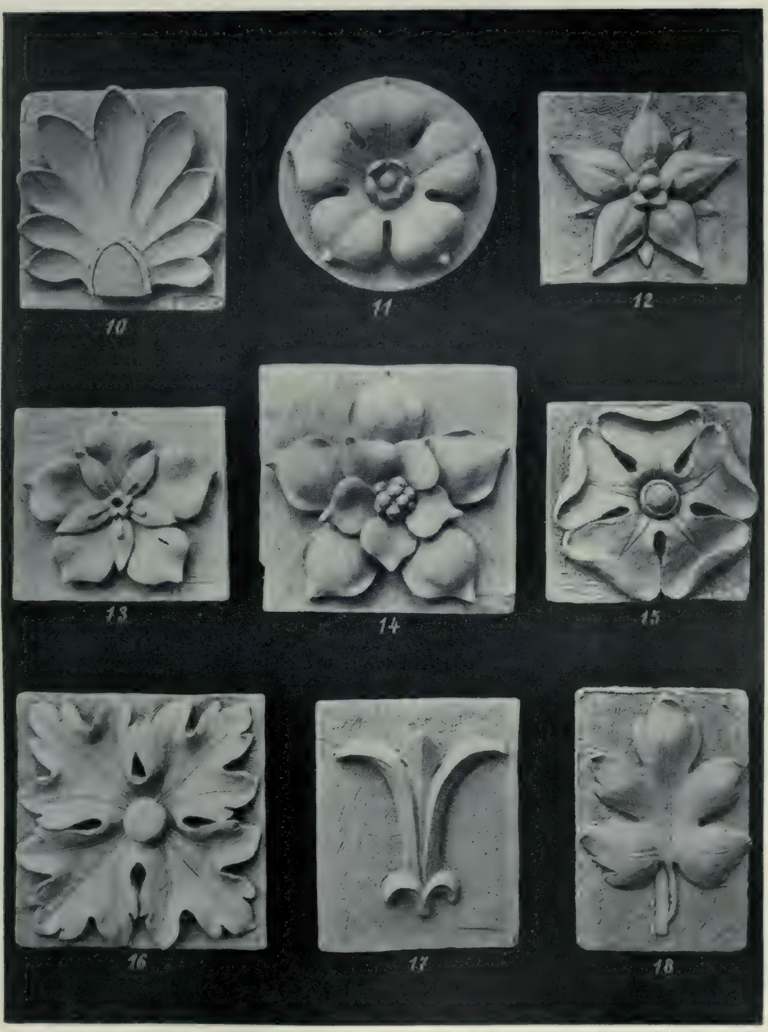


FIG. 126. PART OF THE COURSE IN MODELING, STRASBURG.

The last room visited in this school was a regular school classroom used for wood-carving. In this room were heavy double wooden desks. Near the front edge of the top of each desk was clamped a strip of wood, on the top of which were fastened two cylinders of wood about two and three-fourths inches in diameter and three inches high. Upon one of these a pupil would hold his block of wood while carving it. Nearly all of the eighty-five exercise pieces in the course were quite small, square blocks—perhaps three inches on a side, Fig. 125—and the carving tools with which the work was done were fitted into engraver's tool handles. In cutting, the thumbs of the two hands were held against each other, end to end, to prevent the tool from slipping and cutting the left hand, which must hold the block while carving. This work, therefore, which originated in Strasburg, and was not seen elsewhere, is as much wood engraving as it is wood-carving. The designs are made by the instructor and drawn on the blocks freehand by the pupils.

The work in carving in this school is taught by one of the schoolmasters who has been especially trained in this work. He said that no more than fifteen pupils could be taught at once by one teacher and a smaller number was better.

Unfortunately I did not see a class at work in modeling. Fig. 126 indicates the character of the course. It begins with flat forms of leaves, then the building of a background with a leaf upon it, and so continuing until quite difficult panels of conventional and naturalistic flowers and fruits have been modeled. I asked the principal of the school which of the types of work taught there were looked upon as having the greatest educational value. He seemed to favor the carving, but considered the benchwork in wood and the locksmith work of greater practical value. About four hundred boys in Strasburg take shopwork. This is only about twelve per cent. of the boys who are eligible, tho the instruction is free.

(*To be continued.*)

EDITORIAL

IT is doubtful if any annual educational meeting, unless it be that of the Superintendence Department of the National Education Association, can be classed as of equal importance to the meeting of the National Society for the Promotion of Industrial Education. The fourth annual meeting of this organization, held in Boston, November 17-19, 1910, was characterized by several important features which mark advance in the cause of education.

An Important Meeting

First and foremost, there was manifest a fuller recognition of conditions and qualities essential to the best interests of all classes of society rather than of certain classes. The representatives of different interests, educators, employers, employes, citizens, met on the common ground of the best interests of the child or youth, and there was manifest much less than usual the spirit of condemnation and criticism of opposing factors in the problem of education. The fact of the recognition of the present and future success and happiness of the child as the important element in the problem is of the greatest significance.

Thruout the sessions there was a general agreement that the traditional public school courses are inadequate—not that there should be less done for those who have the possibilities of a life devoted to literary work, but that there must be very much more for the great mass of children who will necessarily devote their life to occupational work.

Great emphasis was given to the assertion that handwork—trade work and industrial work—combined with academic work is cultural; that in our free country such work does not close to the pupil the door of opportunity to the so-called higher education, but that on the other hand it may in some instances give the incentive and cause the awakening that will lead to higher attainment.

Everywhere prevailed the thought of happiness in preparing for life work and happiness in the life of the worker. Dr. Kerschensteiner's great address teemed with the thought of the joy of the worker in his work, and of the opportunity thru industrial education for joy of expression for the many as well as for the few.

The agreement was practically universal that industrial education is a function of public education, that this is the safe-guard of youth against

exploitation, and the assurance of training that will lead to efficiency, manhood, good citizenship and happiness, and that all interests will be thus best served.

In dealing with the questions, whether practical, moral or social, the speakers presented concrete problems and their effort at solution, so that the constructive value of the meeting goes beyond that of previous gatherings. The speakers were notable and the papers and addresses of exceptional excellence, and when published will merit the careful study of all who are interested in education. W. E. ROBERTS.

Dr. Kerschensteiner's Chicago Address

It seems safe to say that no educator coming from Continental Europe in recent years has said so many wise things that needed to be said in the United States as has Dr. Georg Kerschensteiner in his recent tour thru this country under the auspices of the National Society for the Promotion of Industrial Education. His insight into our institutions was quite remarkable, but his elucidation of certain types of German schools in clear and well-spoken English was even more so.

He was much depressed by the excessive division of labor in some of our industries. The pained expression on his face as he recalled what he saw in a shoe factory brought to mind the expression of Ruskin in his chapter on the "Nature of the Gothic," in which he says, "It is not the labor that is divided but the man—divided into mere segments and crumbs of life." Dr. Kerschensteiner said that Germany has nothing like our excessive subdivision of labor.

His criticism of the manual training he saw in certain schools was equally strong. He could not see why children are encouraged to make big pieces of furniture before they can square up a piece of wood properly or make a single joint of the type that must be multiplied many times in the piece of furniture, if it is properly constructed. From this statement it must not be concluded that his pedagogy is of the dried-out kind. On the contrary, he stated with marked emphasis that the first requisite in training in skill is "to cultivate joy in work." "It is in that way that we appeal to the heart," and it is only when the feelings are brought into action that we can most truly educate.

The Aim of the Continuation School.

Probably no part of Dr. Kerschensteiner's address in Chicago was as valuable as that in which he made clear the purposes of the continuation school. The continuation school is not fundamentally an industrial, a technical, or a trade school.

It is a school of general culture for such boys and girls as are apprentices to trades. It is to supply, in a measure, what such children are obliged to lose by leaving the day schools early to learn trades. In order to make school studies most easily intelligible to the apprentices, these studies should be approached from the trade standpoint. This method is pursued not so much for the sake of the trade as for the sake of the culture. From the German viewpoint, then, some of us American enthusiasts on German industrial education have been looking at the culture side of it thru the big end of the spy glass.

Dr. Kerchensteiner made it clear that the advance step which has placed the continuation schools of Munich almost in a class by themselves, even in Germany, was the introduction of the technical work for each of the trades. Shops were equipped with the very best of appliances and placed in the care of the highest type of men in the several trades. To these the apprentices came for two or three hours a week to learn the higher or more difficult processes of the trade and to study materials. Dr. Kerschensteiner gave two reasons for establishing these shops: First, to elevate the trade, and, second, to enable the boy who might happen to be working under an inferior or less skilful master to have an opportunity to acquire skill and knowledge above and beyond what he would get from the master to whom he is bound.

But from the beginning to the end of Dr. Kerschensteiner's address it was clear that his fundamental aim in continuation school work is the kind of culture that makes for the best citizenship, and because such citizenship involves an occupation that contributes to the social good, industrial processes are taught. Fundamentally, then, the continuation school is still not an industrial school but a school for the general education of a selected group of people. The trade is made the basis for educational work, but the degree of culture is not determined by the trade selected, but by the time that can be given to the work of the school. Dr. Kerschensteiner believes that a state of culture can be approached as readily thru the trade as in any other way. In fact, he more than implied that as a method in education the approach to culture thru a trade or specialty is more effective than thru the broad general course in which there is no specialty about which to group the other branches of knowledge. American teachers certainly should be grateful to Dr. Kerschensteiner for his many valuable suggestions and criticisms.

—C. A. B.

Death of Senator Stout.

The death of Senator J. H. Stout of Menomonie, Wisconsin, on the eighth of December was felt with the force of a personal loss by hundreds of teachers who prized his acquaintance as they met him at educational meetings and enjoyed his gracious personality, and by hundreds more who have received the benefits of the remarkable schools that have grown up under his guidance and support. Few men outside the profession have been in such close touch with so many teachers, and fewer still have ever devoted themselves so continuously to the study of educational problems. Many men in America have given their fortunes to education, but Senator Stout gave both his fortune and himself. It seems to have been the great passion of his later years to study first-hand the needs of the common people with reference to education and to provide the ways and means of meeting these needs.

At another time we hope to speak more in detail of the work of Mr. Stout. At this time we merely record the fact of his death and express a warm personal feeling for him, and sorrow that he is to be with us no more. His fine spirit and devotion, however, will still remain in Stout Institute.

In California.

To spend the Christmas holidays in California has long been the Editor's dream. This winter the dream came true. Out of the freezing temperature of Illinois to the land of perpetual roses and orange trees he went by limited express. The warm sunshine gave joy, but he had not been there long, however, before he discovered that California is not all climate. There are about two hundred and fifty manual training teachers in the southern counties of the state, and some of the most interesting high schools to be found on the continent. Moreover, if one may judge from so short a visit, there is a spirit of progress and educational liberty which is quite alluring to the progressive teacher. For example, an up-to-date high school site is not a few corner lots or even a whole square, but from ten to twenty acres. The classrooms, shops and laboratories are not in one four to six story building, but in several smaller one or two story buildings which are grouped with reference to convenience and lighting, and sometimes connected with arcades. School boards are gladly abandoning the grammar school type of building for high school purposes and taking suggestions from the colleges. And why not? Is not the high school to become the "people's college" in America? At Hollywood, for example, where we find the first of this new type of high school,

there is a corner building for study halls, classrooms and offices. Behind this is a building for the sciences and agriculture, which is remarkable for its completeness and arrangement. Behind this is a greenhouse, and beyond that is a large plot of ground for planting. On the front of the lot, and balancing the main building in the group, is the auditorium with smaller rooms for music, elocution and social events. Behind this will soon be constructed a manual arts building to cost $25,000, and back of the site of the manual arts building is an ample athletic field. Between the auditorium and the main building is a home building for household science and household arts.

Since this group of buildings was projected the architect has been called upon to plan five similar ones, and other architects have been at work on the same idea. It seems certain to become the typical high school building scheme for Southern California. Even the large city of Los Angeles has adopted it for its latest building, the manual arts high school.

But the liberal character of the schools is shown not merely in the number and size of the buildings. The curriculum is equally significant. In the Hollywood high school eleven courses are outlined, in the Los Angeles Manual Arts high school, six, and in the Los Angeles Polytechnic high school, eighteen. To be sure, the differences between courses are sometimes very slight, but the spirit of the leaders in high school work seems to be to encourage the development of the high school to meet new needs—industrial and commercial, scientific and artistic —without fear of losing its recognized place as a college preparatory school. We were told that there are many more high school students in Los Angeles than in any other city of similar size in the United States. When the million or more dollars now appropriated for high schools of the new type in Southern California has been expended, the rest of the country will begin to take notice.

This development of the high schools is bringing with it a corresponding development of the manual arts. Indeed, the demand for more industrial training and the success of the Los Angeles polytechnic high school, with its two thousand students, and the new manual arts high school, which already numbers over eight hundred students, are primal factors in the evolution of the high school. Moreover, the high school development in the manual arts is having its effect upon the schools below, so that the great problem in the near future will be where to get trained teachers for all this rapidly incoming work in the manual arts. But to this growing need the state has not been blind, and has established a

state normal school for teachers of the manual arts at Santa Barbara. This new school, under the presidency of Miss Ednah A. Rich, is making its start in the Anna Blake Memorial Building and in the manual training building recently constructed by the city of Santa Barbara. However, this is but a beginning. A superb site of several acres has already been selected on the heights above the city and just above the old Mission buildings. Here with the mountains immediately behind, the quiet city spread out in front and the great ocean in the distance, is an ideal spot for the center of influence in art and handicraft for the great golden state. With a broad policy and an equipment to facilitate the preparation of teachers for high school as well as elementary school work, this training school for teachers will do a great work in the future. It will not do away with the need of such other courses as are now being given at the Los Angeles State Normal School, where hundreds of grade teachers go out every year into the elementary schools and where, because of the great need, special teachers for these schools have been trained. Every normal school in the state will continue to need its courses in the manual arts, and more of them than ever before. The special training school at Santa Barbara will take graduates of the normal schools and other qualified students and fit them for the higher special positions that are rapidly being created. In the establishment of this school California has taken a great step in advance. —C. A. B.

As a frontispiece in this issue we are pleased to present the portrait of Dr. James Parton Haney of New York. Its publication seems especially appropriate at this time as we begin his series of articles based on observations and experience in the development of manual training in New York City. No supervisor in America has done more than Dr. Haney to stimulate a strong professional spirit among teachers and supervisors of the manual arts, and no one has been more interested in the development of a high type of professional literature. His writings in the yearbook of the Council of Supervisors and his work on the volume entitled "Art Education in the Public Schools of the United States," published by the International Art Congress, give proof of this fact.

ASSOCIATIONS

FIRST NATIONAL CONFERENCE ON VOCATIONAL GUIDANCE.

This conference was called under the auspices of the Boston Vocation Bereau and Boston Chamber of Commerce, November 15-16, 1910. It immediately preceded the meetings of the National Society for the Promotion of Industrial Education, and owing to the close relations naturally existing between vocational guidance and vocational training, its meetings seemed to form a part of one general conference. Five sessions were held, and many distinguished speakers addressed the Conference on various phases of the question. Charles W. Eliot, President-Emeritus of Harvard University, Professor Charles Zeublin of Boston, President Richard C. Maclaurin of Massachusetts Institute of Technology, and Dr. Felix Adler of New York spoke in a general way of the social and economic conditions making vocational guidance and training necessary to an increasigly large proportion of our youth, whether trained for the lower or higher grades of occupations, or for industrial, commercial or professional careers. They referred to the value of the vocational idea as a motive for continued and progressive acquisition of knowledge and insisted on the peculiar efficacy of such a motive when acquired early in life.

President Eliot said that the success of the new movement depended on a recognition of the *real* state of society. He insisted on the surpassing value, to the majority of pupils, of constructive work, interpreted in a broad sense, and advocated eye, hand, and sense training, from the kindergarten thru college. Dr. Adler said that vocational advice might prevent some of the worst things "that ought not to be." As regarded vocational training, he indicated that even the elementary school might do much and that the secondary schools ought to be reorganized on a basis of centralized motives. He advocated teaching about vocations in college, largely by means of biography. Professor Zeublin said that this is a movement which conserves human resources; that the majority are unable to cope with the existing economic powers, and that the *less* able and *least* able should be our especial concern.

Professor Paul H. Hanus of Harvard University, Chairman of the Vocation Bureau Executive Board, made an address setting forth the purpose of that Bureau, its accomplishments and aspirations. He said that the Bureau represented organized common sense. He showed the need and possibilities of cooperation with public school systems, and described the common responsibility of parent, teacher and employer. He spoke of the work which had been done in collecting information about industrial opportunities, and in organizing that information in such a way as to make it available in the advising, placing and guiding of young workers. Especial emphasis was laid on the necessity of preserving or promoting the bodily health of the child, and of securing better initial training thru a revision or a revivifying of traditional schools, and the establishment of public vocational schools.

Meyer Bloomfield, Director of the Vocation Bureau of Boston, told why children entered unprogressive employments, and discussed the mistakes arising from misguided ambition promoted by "quack" schools. He said the vocational guide should stand between the teacher and the employer, urging the first to fit the boy for his work, and the second to fit his work to the boy. Supt. Stratton D. Brooks of Boston said that we should permeate public opinion with the idea that the public schools must give both training and guidance. He cautioned against the earlier mistake of a one-sided education; whereas formerly the training was all intellectual, we should avoid making it now all mechanical or vocational. He spoke of the progress which had been made in the Boston public schools, where at least one teacher in each elementary and high school has been assigned to the position of vocational counselor. A special vocational assistant has been appointed in the girls' trade school. A distinction is made between placement and guidance, the latter including the following of the progress of the girl subsequent to her placement. This practice leads to considerable intimate knowledge not only regarding the girls but the employers and the vocational possibilities as well. Aside from placement and guidance, he believed that the teacher would be the best adviser.

Robert A. Woods, of the South End House, urged that in attempting to further this most excellent movement, we avoid taking too much the adult point of view. He spoke of the necessity for developing the idea of organization and leadership, the idea which permeates the business and industrial world and insisted that the spirit of play might be more fully utilized in giving industrial education.

There was suggested the possibility of forming a national society to promote the establishment of vocation bureaus. Opinion was generally favorable to such a project, and it was confidently predicted that this function would ultimately be taken over by the public schools. The Conference adjourned without action on the suggestion, but information regarding the matter can undoubtedly be had by applying to Mr. Bloomfield, Director of the Boston Vocation Bureau, 101 Tremont Street, Boston.

—Frank M. Leavitt,
University of Chicago.

NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

The fourth annual meeting of the society was held in Boston, November 17-19, 1910. The first session was devoted to the consideration of the "Demands and Opportunities for Girls in Trades and Stores." As the topic would indicate, the discussion related particularly to the lower grades of commercial and industrial work, tho the possibility of climbing, by means of this work, to higher positions was given due attention. The possibilities of the needle trades and of the department stores were explained and some interesting experiments in classes in salesmanship for clerks in department stores were described. The attempt had been made to give the girls some appreciation of the value to their employers of their knowledge of the goods displayed, of the principles of good salesmanship, that is, the psychology of salesmanship, and of their ability and desire to serve

the customer acceptably. Representatives of employing merchants commended the work of these classes. The absolute demand which the needle trades make upon the girls for accuracy and speed and for quick understanding of the fore-woman's directions was urged in defence of short term trade courses for girls in these trades. While the benefit of longer courses and broader training was admitted, the social value of such enterprises as the Manhattan and Boston Trade Schools for Girls was conclusively shown. Emphasis was laid on the value of training in drawing and color for both store and trade workers.

At the second session, "The Training of Teachers for Girls' Trade Schools" was discussed. Mrs. Mary S. Woolman, Director of Domestic Arts Department, Teachers College, New York City, traced the progress of the Manhattan Trade School for Girls during its eight years which seemed to indicate that the requirements of industrial schools demanded, on the part of their teachers, accurate knowledge of trade conditions and actual trade experience. She said that the promoters of the school had discovered that the practical trade work possessed a cultural value entirely unsuspected and unsought for at the outset. She showed that such schools should closely conform to the requirements of local conditions, and that especial care should be taken not to "overstock" the labor market in any given industry or locality. She expresses the opinion that the elementary schools should do more to prepare for trade schools. She emphasized the importance of conserving the physical health of the girls, of acquiring the sensitiveness to trade influences, and of turning out a salable product, while upholding trade standards and trade prices.

Miss Florence M. Marshall, Director of Girls' Trade Education League and Industrial Training Department, Women's Educational and Industrial Union, Boston, insisted on the two-fold preparation essential to the teacher in an industrial school, a point indeed which was emphasized thruout the Conference. She said that in the earlier stage of the work the professional teacher was most needed while later the trade worker was most effective. All workers would be most successful, however, if trained in both directions. To supply the immediate demands, she suggested that normal school graduates be required to gain some practical experience in store or shop and that trade workers be given special pedagogical courses. She spoke of the benefit to be derived from conferences, and of the possibilities of evening classes for industrial instructors.

Miss Sarah Louise Arnold said that time and experience were absolutely necessary for the solution of the problem. She spoke of the pioneer work of philanthropic societies in other spheres of education and said that hope lay in generous experimentation and devoted service.

Charles A. Prosser, Deputy Commissioner of Education, for Massachusetts, discussed the foregoing papers. While in no wise under-rating the importance of training teachers, he said that the director of the industrial school determined very largely the policy and efficiency of the institution. He insisted that the director should have a three-fold point of view,—industrial, pedagogical, and social. He reminded the Conference that business is not a benevolent institution, and that the pedagog is not always perfectly clear with regard to disciplinary and cultural values. He said the industrial school should combine in varying proportions "practice and thinking about practice."

At the banquet, the third session, the addresses were inspirational rather than instructive. Professor Charles R. Richards, President of the Society, made some comparisons between industrial education in the United States and in European countries. He said that the lack of unity is our greatest drawback, the lack of cooperation between the employer and the schools, and stated that the school men alone could not solve the problem. Charles H. Winslow, Representative of the American Federation of Labor, made a careful and authoritative statement of the position of organized labor. It was essentially the platform adopted by the Toronto Convention, but contained one additional plank. It admitted the necessity of turning out a finished product in some instances at least, for it demanded the "minimum of production and the maximum of instruction." The statements regarding the needs and rights of the employer were temperate and thoroly appreciative.

The fourth session was devoted to "Apprenticeship and Corporation Schools," and the fifth to "Part Time and Evening Schools." Taken together these two sessions showed the great prominence given to the consideration of the training of machinists, or iron and steel workers generally, in discussions relating to industrial schools. The impression left by the addresses was that the apprenticeship system is not dead, as we have so often heard, but transformed and adapted to present industrial conditions. It was also apparent that the new form of apprenticeship is profitable only for the large corporations or for combinations of manufacturers, that it was lack of training for leadership which impelled this modern effort, and that therefore, whether they acted independently or in cooperation with the public schools, the benefit would be derived primarily by the ablest boys. It was demonstrated that for the less fit, for those who would occupy the intermediate or lower grade positions, the more general training of public school industrial classes was absolutely essential.

Prof. Paul H. Hanus of Harvard emphasized the fact that all nations are realizing the importance of supervising the education of children for a longer period, and that this is not peculiar to industrial education. The American method of procedure, he said, is first to provide for the awakening of public opinion, second for experimentation, third for organization.

The Fitchburg and the Beverly part time cooperative plans were fully described. The latter is a distinct advance on the earlier experiment, at least from the standpoint of labor, since the public school has full control of the membership of the classes. It differs also in admitting boys of fourteen years or over without graduation from the elementary school as a requirement. The purpose of the school is clearly stated to be training for the ranks.

A notable address was given by Frank B. Dyer, Superintendent of Schools, Cincinnati, Ohio. He described the continuation schools recently organized under the new Ohio law, the first of its kind enacted in this country, which, requires the continued training of certain groups of children who leave school early and enter gainful occupations. This training must be given between the hours of eight A. M. and five P. M. during the school term. Mr. Dyer maintains that "The apprentice is a day school proposition."

At the sixth session Dr. Georg Kerschensteiner, Superintendent of Schools, Munich, Bavaria, gave an illustrated address on the excellent and complete

system of the industrial continuation schools of Munich. Great stress was laid by Dr. Kerschensteiner on the value of "joy in work" and these schools are intended to promote this joy by so informing and training boys, who had already entered their life work, that they might excel in it. The system, while not adapted to American conditions, commended itself to all as a worthy example of civic interest in the welfare of industry and of the industrial worker as well.

The last session, exclusive of the business meeting, at which James P. Munroe, Treasurer of the Munroe Felt and Paper Company, of Boston, was elected to the office of president for the ensuing year, was devoted to the consideration of "The Social Meaning of Industrial Education." Mr. Munroe said that we should consider not only the immediate effect of industrial training but the ultimate effect, not only the effect on the individual but on society. He expects that the United States will advance rapidly in the matter of vocational training in the next forty years, yet believes that the industrial results will be small as compared to the social results. He said that both capital and labor are at present ignorant of the real social conditions and must be educated. The whole session emphatically demonstrated the need of appropriate training for the mass of workers who would be unaffected by the industrial and trade schools which had been the subjects of most of the discussions of the week.

Miss Elizabeth B. Butler, of the Bureau of Social Research, New York City, spoke of the effect of the speeding-up process, and the system of inspection employed in factories, and said that they were the causes of much of the instability of the lower grades of labor. She said that social disintegration was the penalty we must pay for failure to educate adequately the operatives in such industrial establishments. She also affirmed that the responsibility went back of the giving of wages, and that the employee should be so trained as to be *worth more* to the employer.

The most notable address of the session, and perhaps of the Conference, was that of Howell Cheney, of Cheney Brothers, South Manchester, Conn. This address should be read by every manual training teacher in the country who desires to vitalize the constructive work of the elementary school. He discussed the cause of the lack of progress in children when first entering industrial life, which he thinks is due largely to the unrelated nature of the school work which has gone before. He asked whether low grade industrial work might not be made educational, and thought that, tho difficult, it was possible. He pointed out that every machine process is the development of a hand process, and said that if children had some knowledge of these processes and some appreciation of the possibilities of high grade machine operating, even factory work might be made relatively desirable. By this means also it might be made possible for the operative to see the way out of what appears to him to be unprogressive and monotonous work. This release would be effected by *going thru* the difficulty rather than by attempting to *escape* it. Comparing the relative value to the young child of life at school and life in the factory, Mr. Cheney said that he considered it was fair to apply to the school the same test as to the factory and ask how much opportunity either offers for progress.

The dominant note thruout the Conference was distinctly social. Again and

again it was stated that any agency working alone was totally inadequate to meet the existing needs. "Together" was the great word and the spirit of the meeting was such as to give confidence that unity was immeasurably nearer than it was two or three years ago. It was equally pronounced that all,—merchants, manufacturers, philanthropists, social workers, and educators—alike are looking expectantly and hopefully forward to a sort of glorified public school system as the only possible and desirable solution of the problems which are fundamental to the very existence of our democratic institutions.

FRANK M. LEAVITT,
University of Chicago.

NORTHERN ILLINOIS STATE TEACHERS ASSOCIATION.

The annual meeting of the Eastern Section was held at Mandel Hall, University of Chicago, November 4th and 5th. The attendance was the largest in the history of the Association.

The program was of especial interest to manual arts workers, each paper dealing with some phase of "The Concrete in Education" which was the general topic for the meeting. The afternoon of Friday was devoted to excursions to the Art Institute, the Field Museum, and to the Pullman Car shops. These excursions were all under expert guidance and proved of great value to the teachers as well as furnishing a valuable example of how such excursions should be conducted.

At the first session, Professor C. A. Bennett, of Bradley Polytechnic Institute gave a very clear presentation of the present status of the manual arts in relation to education. The manual arts he defined as such part of the fine and industrial arts as have to do with the hands. The manual arts have a very definite place in respect to the aim of education. Ideals change. Today the aim of education is a preparation for life under existing conditions, or in other words—social efficiency. Quoting Dr. Bagley, "we should train the individual for productivity, not merely directly, but indirectly." The great mass are producers thru the use of the hands. Productivity means thoro work and more time. The problem is how to get more time. We can expect no great results on the vocational side with no outside preparation and only one hour in school. But it is not merely the hand worker who needs this training. We need ideals in choosing hats, dresses, etc. Simple knowledge of tools and mechanics leads to ability to make minor repairs about the house. It enables us to go to a furniture shop with ideals. If we have no ideals the salesman sells us what he wants to sell. Acquaintance with the manual arts enables us to get the best out of life. The manual arts transmit some of the choicest thoughts of the world.

The manual arts are both subject matter and method. The emphasis has varied in different periods of its history. Heusinger and Froebel made handwork the center. Pestalozzi made it a means of teaching the other subjects. Salomon, Goetze and others had the Froebelian view. Col. Parker had the Herbartian view—a method in education. Dewey in "School and Society" deals with the change in point of view. In industrial education, the content of manual training or the subject matter side is emphasized. Let us hope that the other side is not forgotten, and keep the values it has as an educational process.

Mr. Bennett criticized some of the primary handwork in that it did not deal with a sufficient variety of material. We should not aim to develop rivals of the aborigines in basket-making. Manual training in these grades should be a method. Expression of ideas thru the hands rather than technical accuracy should be the ideal, gradually satisfying more discriminating ideals.

In the grammar grades we should emphasize technique as much as we avoid it in the primary grades. Pupils are in a place where they can and should do things well. In the upper grammar grades the work might even be vocational. In the high school the manual arts should be treated distinctly as a special subject and should be up to a high standard as far as we go.

Supt. Mott, of Richmond, Indiana, dealt with the field trip, or excursion. While especially valuable as an aid to geography and nature study the field trip is valuable also in connection with a study of industries. It is difficult to carry the spirit of study along on these trips away from the influence of the schoolroom walls amid distracting influences, and it requires preparation beforehand on the part of both teachers and pupils.

Chas. A. McMurry, of Dekalb Normal School, stated that concrete material is very abundant and that we have almost "gone to seed" on this line. In spite of this, much of our instruction is dry. There is a divorce between illustrative teaching and thought material. The excessive use of concrete material may be a dissipation like moving picture shows. As an example, illustrative pictures in text-books are often not made use of in clarifying thought.

The outcome of excursions is often a jumble in the mind. It should clarify itself by the underlying thought. Like wealth, we must learn how to use this concrete material. Manual training should be a reaction against this verbalism. The manual training teacher should get into the shop and use tools. There is also a danger that manual training and other subjects may degenerate into mechanical routine. The teacher alone can save us. A thinking child and a good teacher can show the way.

Dr. Chas. H. Judd of the University of Chicago, gave a summary of the meeting. He stated that we have reached the stage where we must decide what we are going to do with this concrete material and reconcile it with the abstract. We have a great mass of concrete material which is not digested. It is wrong to assume that the pupil starts out with neither concrete or abstract. The child lives in an abstract world at many times, sometimes we get into this world. We present one world and he has another of his own,—the difficulty is to join these two. We systematize the external world and miss the organizing of the interior world so as to bring it together with the external.

The concrete world must be built up with the same symmetry as the imaginary world. Children have plenty of imagery. It needs refining. It is the business of manual training and such subjects to give productive images. The old school gave plenty of images but they were not always systematized and organized. We can give pasteboard, wood, etc., and get plenty of imagery. The child starts out with an imaginary world. Imagery of later life is more restricted on account of knowledge. Adult imagery is "settled down".

—LEONARD W. WAHLSTROM.
Francis Parker School, Chicago.

OHIO ART AND MANUAL TRAINING ASSOCIATION.

The regular annual meeting was held at Steele High School, Dayton, on Friday, November 11th, 1910. There was a good and representative attendance of Ohio teachers of manual training, art, and domestic science. The Association was called to order by the president, George A. Seaton, Shaw High School, Cleveland, for the business session. After the election of officers and the transaction of some minor matters of business the further work of the Asociation was carried on in sections.

MANUAL TRAINING SECTION.

The chairman of this section was J. I. Lambert, supervisor of manual training, Dayton, and the first speaker was W. E. Painter, supervisor of manual training, Newark, who read a paper on "Shop Economics." Mr. Painter said in part:

"The arrangement of the benches and the placing of the tools has much to do with the economy of shop practice. We wish, however, to call attention to the educative value of the best posible arrangement rather than to say what that arrangement should be. If the boys are comfortably and conveniently seated away from the regular benches, the class demonstrations can be given with the best possible results. If the tools are arranged in a convenient and orderly manner, it not only saves time but cultivates habits of neatness and order. The better and more convenient the arrangement, the easier it is to keep things in their places. Of course it is necessary to insist that things be put where they belong. Boys are not perfect. . . .

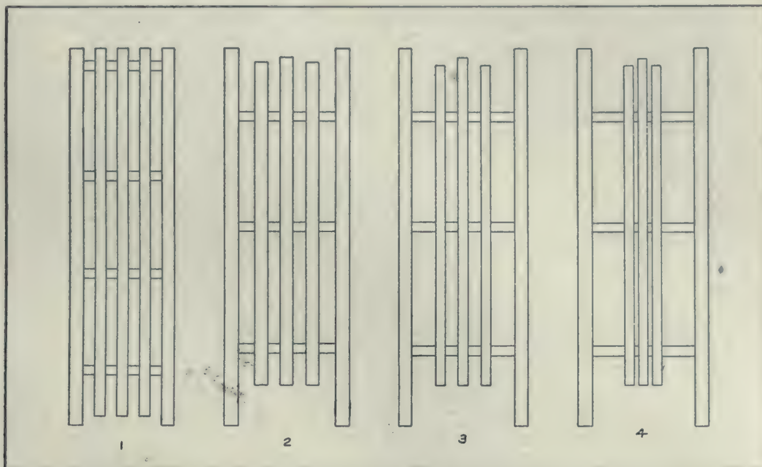
"It is not enough to tell the boys to be careful of tools and material. Some concrete illustration, something that will stimulate them to create rather than destroy values must be planned and presented in an impressive manner. With beginners in the elementary school the value of a piece of wood may be impressed upon the minds of the boys by weaving the facts of the growth of the tree, the felling and converting into lumber, the transportation, drying, resawing, planing, etc., into a story. Show that everything that has been done to the wood has added to its value, and that his work upon it is the most important of all. Will he be able to make it into something useful and worth while?, or will he destroy all that has been done for its improvement? . . . .

"A systematic approach to the solution of all shop problems should be insisted on from the first. The beginner should not be left to his own meager resources, blundering along as best he can and becoming discouraged with the results of his efforts. He is given the tools of modern civilization, let him have the engineer's method of using them. Most of the difficulty of the what and the how of any problem in construction, from the simplest to the most complex, may be cleared away by sketches and working drawings. Errors are easily corrected on paper and many of them, if not all, may thus be eliminated before the tool work is begun."

The second paper was presented by Thomas K. Lewis, Department of Manual Training, Ohio State University, Columbus, on "Constructive Design." Professor Lewis recommended that a course in design be made a part of the teaching of each craft, many more problems being worked out in the design than can be made

in the shops. Many of the problems need not be worked over for dimensions, but all those that are to be carried thru to completion by the pupil should be finished even to the preparation of lists of materials required, etc.

In the high school three lines of work should be presented: (1) mechanical drawing, which is fundamental to all courses; (2) shopwork; (3) constructive design adapted to the particular shopwork taken by the pupil.



In illustrating a method of presenting the subject, it was suggested that proportion is an important element in design. "How do we know the difference between good and bad proportion? We can often select the best proportion if we are at the same time glancing over those which are *not* good. It is a simple problem to select the best if all are arranged like a scale in the order of their differences. Of course, we may make the best one first; but we do not feel sure it is the best until we have made the others. The comparison helps us to see it. . . .

In the end for magazine and newspaper rack shown, No. 1 is very monotonous because of the repetition of spaces and wooden strips, and uniform outline at the top resembling a gate; No. 2 tends to obviate both, while No. 3 is better, but No. 4 shows the extreme arrangement, in which the large spaces are too large for the decoration strips. Going back again, the large space in No. 3 is questioned; even No. 2 receives some consideration; and finally the most delicate balance of spaces and strips is found to be a design between Nos. 2 and 3.

"A practical knowledge of the material to be used is necessary. It is certainly true that clay in a tile would require a design different from that to be used in 28-gauge sheet silver, or 4-ounce silk as compared with burlap."

A plan for use in the presentation of the study of design was suggested, as follows: (1) General idea, which decides material only, as wood, metal, clay, etc.; (2) Article to be made, decided upon from the use to which it is to be put; applied design has reference to planning or arranging of article to be designed;

ONE PANEL FROM THE 1910 POSTER SHOW, SEVENTH AND EIGHTH GRADES OF THE COLUMBUS, OHIO, PUBLIC SCHOOLS.

(3) Personal use or intention of article to be designed; (4) Limitations of material; (5) The two considerations of use and esthetics; (6) Drawing of some form which will to a certain extent embody the foregoing ideas; (7) Problem of finding an esthetic source for the design and the satisfaction of personal requirements; (8) Sources of ideas for design may be classified as follows: *a.* Geometric, as squares, rectangles, circles, etc.; *b.* Plants, as flowers, leaves, etc.; *c.* Animal forms, as bird, cat, etc.; *d.* Objects used in the industries, as ship, vehicle, building, etc.; *e.* Imaginary forms, as cupid, angel, centaur, mermaid, dolphin, devil, etc. . . .

"Of what use is all this study of proportion, relation of lines, and grouping of lines? Is it for the technical results? No, there is a stronger element in design than that; and that is the designer's conception, thought, or feeling. From an inspection of a designer's work we should carry away the impression of his idea, imagination, or creation; we should feel the power of his individuality. The study of design should develop individuality—even more so than the execution of the design does."

ART SECTION.

The chairman of the Art Section was J. J. Rogers, Cleveland, and the first speaker was Supervisor W. D. Campbell, Columbus, on "Posters as an Educational Problem in Art." He said in part: "Educational work deals with the masses, therefore problems should be given which are closely related to the interests of the masses—problems dealing with ideas that are current in every-day life. . . . The foundation material for all work is to be found in nature (including plants and animals), in pose, in the industrial world, and in arts and crafts problems.

"The suggested order of procedure is as follows: (1) Drawing from observation, in outline, using lead pencil; (2) Composition, the filling of a space pleasingly; (3) Use of color; tinted paper with color schemes suggested by magazine covers, Japanese prints, etc.; flat tones may be applied to furniture, walls, dress, posters, etc.; (4) Outline.

"White paper should not be used. In teaching the handling of the brush, attention is given first to the color, then to its application to the paper, and finally to the best methods of handling the brush to obtain the results desired." The address was fully illustrated by posters made by pupils in the Columbus schools.

DOMESTIC SCIENCE SECTION.

The chairman of the section was Miss Rachel Colwell, president of the Ohio Chapter of the American Home Economics Association. President W. O. Thompson, Ohio State University, gave a short address dealing with the problems confronting domestic science teachers and presenting forcefully the necessity for teaching the subject as an applied science with a new and larger meaning. The remainder of the morning session was given over to business matters.

After luncheon, Miss Bishop, Cleveland Technical High School, opened the discussion of the topic "The Use of Drafting in the High School." Several speakers emphasized Miss Bishop's opinion that the teaching of drafting develops skill in handling patterns and confidence in working out original ideas together with ability to meet unexpected situations in the home. It seemed to be accepted by the majority present that drafting according to some very simple plan could

begin in the sixth and seventh grades, thus establishing a strong working basis for development in the high school later.

The topics "Material for Table Tops" and "Location of Large Pieces of Equipment in School Kitchens" could not be discussed at length because of the limited time. It was voted that the ideal kitchen accomodates twelve workers, and that since so many considerations arise in determining what should be in any school kitchen, it is best to discuss kitchen construction and equipment simply in terms of ideal conditions. The materials discussed for use on table tops are: tile, Noris glass, cement fiber, wood, and Albarine—tile, of course, being preferred. Three general plans were suggested for the arrangement of the tables: the hollow square, two parallel lines, and the group method. No decision was reached as to preference.

FRED C. WHITCOMB.
Miami University, Oxford, Ohio.

HIGH SCHOOL CONFERENCE.

The Seventh Annual High School Conference was held at the University of Illinois on Thursday, Friday and Saturday, November 17-19, 1910, with the largest attendance in the history of these conferences. The increase in attendance from seventy-five in 1905 to nearly eight hundred in 1910 is certainly a remarkable growth, and demonstrates the fact that the High School Conference is meeting the needs of the high schools of the state.

The principal features of the general sessions were two addresses: "Needed Readjustments in the High School Curriculum" by Professor E. C. Elliot, Department of Education, University of Wisconsin; and "State Aid to High Schools in Minnesota, and How it Works." by George B. Aiton, State High School Inspector.

There were twelve sections represented, each with two sessions on Friday morning and afternoon, as follows: Administration, Agriculture, Biology, Classics, Commercial Studies, Domestic Science, English, Mathematics, Modern Languages, Physical Sciences, Social Sciences and Manual Arts. The Manual Arts Section held two interesting sessions in the Lecture Room of the Wood Shops. W. T. Bawden was appointed Chairman and P. J. Freeman, in charge of the Mechanical Engineering Shops of the University of Illinois, Secretary. William H. Varnum, Director of Fine Arts at James Millikin University, Decatur, was the first speaker, and as chairman, presented the report of the committee appointed at the Conference in 1908 to arrange courses of study in mechanical drawing, freehand drawing and design that would be recognized by the University for entrance credit. The report outlines work for grades one to eight inclusive, and also the four years of high school. For students desiring to prepare for engineering or architecture, a special high school course is prepared, giving more attention to mechanical drawing, design and crafts. In this course it is recommended that approximately one-third of the time be given to representative drawing, one-third to modeling, design and crafts work, and one-third to mechanical drawing. In the regular high school course, approximately one-third of the time should be devoted to representative drawing and two-thirds to decorative composition, design, constructive design and crafts work. It is proposed that this high school work be offered for a credit of two units on the basis of 240 hours for each. The

work outlined for the grades is such as will prepare the student to do his high school work to the best advantage.

The members of the committee working with Mr. Varnum were Miss Ida M. Tindall, Supervisor of Drawing, Pontiac, Fred D. Crawshaw, Department of Education, University of Wisconsin, E. V. Lawrence, formerly connected with the Fine Arts Department of the University of Illinois, and F. D. Thompson, Galesburg. The outlines of work as submitted by the committee are substantially in agreement with those adopted by the North Central Association of Colleges and Secondary Schools and the Western Drawing and Manual Training Association.

In the discussion following the report, some doubt was expressed as to the ability of the average high school student to do the work outlined. The chairman of the committee reported that inasmuch as the syllabus was a collection of various methods of doing this sort of work, it was not to be considered something new and untried, but the result of actual experience in the different schools. It was brought out in the discussion that the drawing courses are all tending toward the practical and the opinion was expressed by some members that there should be more mechanical drawing in the grades. After considerable discussion as to the advisability of adopting the report of the committee at this time, a motion was made and carried that the report be adopted.

The next speaker was Supt. F. U. White, of Galva, who reported upon the results obtained from the use of the first unit of manual training. The speaker said that no difficulty was found in doing the work prescribed and that the students were putting in extra time in order to be allowed to take the work in manual training. He found that there is great value in the use of simple exercises as a means of leading up to the more advanced work. Of the students eligible to take the work in manual training the first year, ninty-nine per cent of the students were enrolled; for the second year there were eighty-one per cent, fifty-two per cent for the third, and twenty-seven per cent for the fourth year.

The next speaker was Miss Anna G. Brown, supervisor of manual training, Jacksonville, who said that the work was easy to follow out and suggested that the list of electives should be larger so that the majority should not feel tied down to a rigid course. A. C. Newell, director of manual training, State Normal University, Normal, reported that he had found it a good plan to present the review work in the first part of the first year of high school in the form of exercises quite different from those used in the eighth grade. He was of the opinion that some modification of the exercise method is better than to attempt to build large pieces of furniture which require too much time to finish.

The next speaker was Superintendent H. B. Wilson, of Decatur, whose subject was "Motivising in Manual Training." The speaker illustrated very aptly how much better work may be accomplished if the person is only interested in what he is doing. He suggested that the child should be taught that there is something to be gained by doing any certain work; lead him to attempt to make some object which he may present to the school or to his parents and then if he encounters difficulties in the construction of the object, he should be shown by means of the exercises how that difficulty can be overcome. Thus he will be led on, rather than driven, and with much better results. He does not then do the work blindly but goes at it like an artist who attacks any problem in design. If the teacher

will look to the play of the boy in school he will find many things which can wisely be made in the manual training course. Let the boy make a sled in the winter season or ornaments of metal and he will not only get the practice but the pleasure as well. The child will feel that the thing he is doing has a purpose and some meaning and will gladly do all necessary work to accomplish the end desired.

The meeting adjourned at noon for luncheon which was served by the faculty of the University of Illinois in the gymnasium of the Woman's Building.

AFTERNOON SESSION.

The first speaker at the afternoon session was Professor F. D. Crawshaw, University of Wisconsin, who presented an outline of work to be offered for the second unit in manual training. The first unit of work has already been outlined and accepted by the University of Illinois. In discussing the details of the work to be offered for the second unit, Mr. Crawshaw recommends that no single line of work be prescribed, but that the student be offered the opportunity to elect from the group consisting of machine drawing, wood-turning and pattern-making, wood-turning and cabinet-making, forging and machine-shop. It is proposed that any combination of the subjects may be made providing the student does no less than 180 hours in any given subject towards credit for the second unit. It was suggested that the presentation of this work should be in the form of a manual and not merely an outline. It should consist of the course of study and outline, together with a set of suggestions for the teaching of the subjects. We need a standardization which will permit a certain amount of latitude, rather than an ironclad outline. In reply to a question it was suggested that a bibliography be added to the outline. The Manual Arts Section voted to recommend to the general Conference Committee of the University that the report be printed for distribution.

The next speaker was Miss Harriet Day of the University of Illinois upon the relations between art and manual training. The speaker stated that the high school is too much a preparatory place for the college; that it does not train sufficiently for life work. The period of reconstruction has continued from after the Civil War until 1896, as can be shown by the many ugly decorations in buildings and design, but now we are beginning an era of more simple tastes. The idea of the design in color should be taught which would aid in the selection of every day materials in life, so that the purchaser would be guided by proper harmony in color and not by price. Teach manual arts to train the pupil to design objects which may serve a useful purpose. There is great need for household arts and also art in dress so that we may not blindly follow fashions.

A permanent executive committee was appointed to have charge of the activities of the ensuing year and the arrangements for the program for the 1911 Conference. This committee is composed of E. J. Lake, department of fine arts of the University of Illinois, Chairman; Miss Clara E. Ela, director of art department, State Normal University, Normal; Miss Anna G. Brown, supervisor of manual training, Jacksonville; and A. P. Laughlin, supervisor of manual training, Peoria.

Dean W. F. M. Goss of the College of Engineering was present and took the opportunity to express his appreciation of the work of the Manual Arts Section. He stated his opinion that the time may come when the work of the college in the field of manual training will be given over to the high school, and the college will then push further into engineering fields in its shopwork. The engineering college must take up the problems of shop management, costs, etc., and other similar questions, and leave the elementary work to the high schools.

P. J. FREEMAN,
Department of Mechanical Engineering,
University of Illinois.

BOSTON MANUAL TRAINING CLUB.

A special meeting of the Club was held at the North Bennet Street Industrial School, Saturday, November 19, to listen to an address by Robert H. Lawsson, Director of the Beverly Industrial School of the United Shoe Machinery Company, Beverly, on "Mechanical Drawing for Industrial Schools." In this school practically no time is spent on geometrical figures; the work of drawing and sketching parts of the machines which are made in the shop is begun at once. A new idea is the making of assembly drawings on brown paper and then having the student go over the pencil-lines with colored pencils; thus, yellow for brass, blue for steel, black for cast iron. In this way the boys were able to grasp the idea of the shape and position of the various parts and the board of engineers is saved much time in checking the drawings.

The regular meeting for December was held on Saturday, the 3d, at which time Arthur Carpenter gave a very inteesting and instructive talk on the "Origin and Manufacture of Various Varnishes and Glues." The talk was illustrated with a large number of specimens showing the various kinds of products and the stages of manufacture. —EDWIN M. ROBERTS, Secretary,
74 Stevens Street, Lowell, Mass.

MISSOURI TEACHERS' ASOCIATION.

The Missouri State Teachers' Association met in annual session in St. Joseph, November 10-12, over four thousand teachers registering. In the general and department meetings considerable attention was given to manual, industrial and vocational training. In fact the broad theme running thru the program might be called "The Practical *vs.* the Cultural Aim of Education."

President J. A. Koentz, of Carrollton, in his address on "What is a Practical Education?" defined the term to mean and include the ability to live in harmony with one's age and surroundings, to contribute to the material or spiritual interests of mankind or both, and thru this ministry to be enabled to earn an honest living, He also said that the present trend toward vocational training is no cause for alarm. On the contrary, it is a hopeful sign when the relation of an education to a life of usefulness can be clearly and directly traced.

"Resolved, That the Public Schools Should be Vocationalized." was to have been debated by Dr. A. E. Winship, Editor Journal of Education, Boston, and

J. C. Monaghan, of New York. Prof. Monaghan was ill and unable to be present and his place was taken by Supt. Carroll G. Pearse of Milwaukee. The main points brought out by the affirmative was that the great waste in natural resources now going on in America could be minimized if vocations were taught in the schools, and that the great numbers of boys and girls, who go out of the schools unprepared to earn a living, could be given the knowledge of a trade. Dr. Winship contended that to teach boys and girls trades would but place on the market more persons than would be necessary in certain trades, and that places would have to be sought at other employments. He declared that if boys went thru school and secured a good high school education, they nearly always found renumerative employment. He favored manual training as now taught in the schools.

C. G. Rathmann, assistant superintendent, St. Louis, read a paper on "The Progress of Vocational Education in Germany," before the Educational Council. "How Can the Demand That Industrial Training be Made an Integral Part of the Elementary School be Fulfilled?" was the topic discussed in the Department of Elementary Schools: 1. Guiding Principles, Prof. W. W. Charters, Univ. of Mo., Columbia; 2. Practical Problems Involved, Miss Ada Van Stone Harris, Asst. Supt., Rochester, N. Y.

Before the Department of Drawing and Manual Training several ten-minute papers were read, followed by an address on "The Trade School and Manual Training," by Lewis Gustafson, superintendent David Rankin School of Trades St. Louis. He said, in part:

"Trade training is not manual training as the latter is now popularly understood. It is not the making of raffia baskets, or glove-boxes, or mission furniture, or hammered metalwork. It is not even household cooking, or home dressmaking or millinery. These things are all excellent; they are essential elements of our modern education; but they are not trade teachings; they are not industrial education; only by the greatest laxity of interpretation are they vocational training. They are not vocational, because they do not train for a vocation; they are not industrial, because they have nothing whatever to do with industry.

"Wherever and whenever manual training is taught in such a way that in addition to these purposes and functions it has the purpose and function of giving boys and girls a knowledge of the fundamental principles of industrial and other gainful occupations, it becomes to that extent vocational and industrial. Industrial or vocational training is more or less general. Like manual training it may be taken up by young children in the elementary schools. In fact it may be and often is incorporated with manual training; it may even be a highly intensified form of manual training. To be truly vocational it must be free from dilettanteism. One might call it applied manual training, in the sense that we speak of applied art, applied mathematics or applied science. It must be manual training for future vocational use.

"Trade teaching is highly specialized and definite. It is the preparation of a boy or a girl for earning a living in the exercise of a vocation called a trade, and a definite trade at that. No child under the age of fourteen or fifteen is prepared to undertake seriously the learning of a trade; and sixteen or seventeen is a better age than fourteen. By common consent most trades take apprentices at a min-

imum age of sixteen. To speak of trade teaching in the elementary school is absurd. What does a child of ten or twelve or fourteen know about life that he should at that age choose his life vocation? What right have we to choose it for him? Even if the choice were made, what could he learn that he could put to remunerative use of the highly specialized, highly skilled, and physically laborious activities of any trade? Only in the years that belong to the secondary school has the real trade school a place." —AUGUST AHRENS,

State Normal School, Warrensburg, Mo.

NATIONAL EDUCATION ASSOCIATION.

Secretary Shepard has issued a bulletin announcing the meeting of the Department of Superintendence at Mobile, Alabama, February 23-25; and the Forty-Ninth Annual Convention of the National Education Association at San Francisco, July 8-14, 1911.

ILLINOIS MANUAL ARTS ASSOCIATION.

The announcement of the Mobile meeting one week earlier than had been anticipated required a change in the plans for the meeting of the Illinois Manual Arts Association which had been scheduled for February 24-25. The executive committee, after consultation with the local committees at Normal and Bloomington, decided to postpone the meeting to Friday and Saturday, March 3-4, 1911.

The prospect of an unusually strong program and the excellence of the railroad connections to Bloomington should combine to make this the best meeting that has yet been held by the Association. The sessions on Friday afternoon and evening, including the annual banquet at six, will be held in the new Manual Arts Building of the State Normal University at Normal, and the Saturday morning session will meet at the Bloomington High School.

A significant feature of this meeting is to be the presence, and participation on the program, of three members of the Sub-Committee on the Manual Arts, of the Illinois Education Commission. The chairman of the Sub-Committee, Eugene Davenport, Dean of the College of Agriculture, University of Illinois, will make the principal address following the banquet on Friday evening. Dr. David Felmley, President of the State Normal University, Normal, and Dr. T. C. Burgess, Director, Bradley Polytechnic Institute, Peoria, will address the Association at the Saturday morning session. A full and frank discussion of some of the problems of the manual arts in the public schools is promised.

Copies of the program may be obtained from the secretary, Wilson H. Henderson, Public High School, Springfield, with whom also may be made arrangements for banquet reservations.

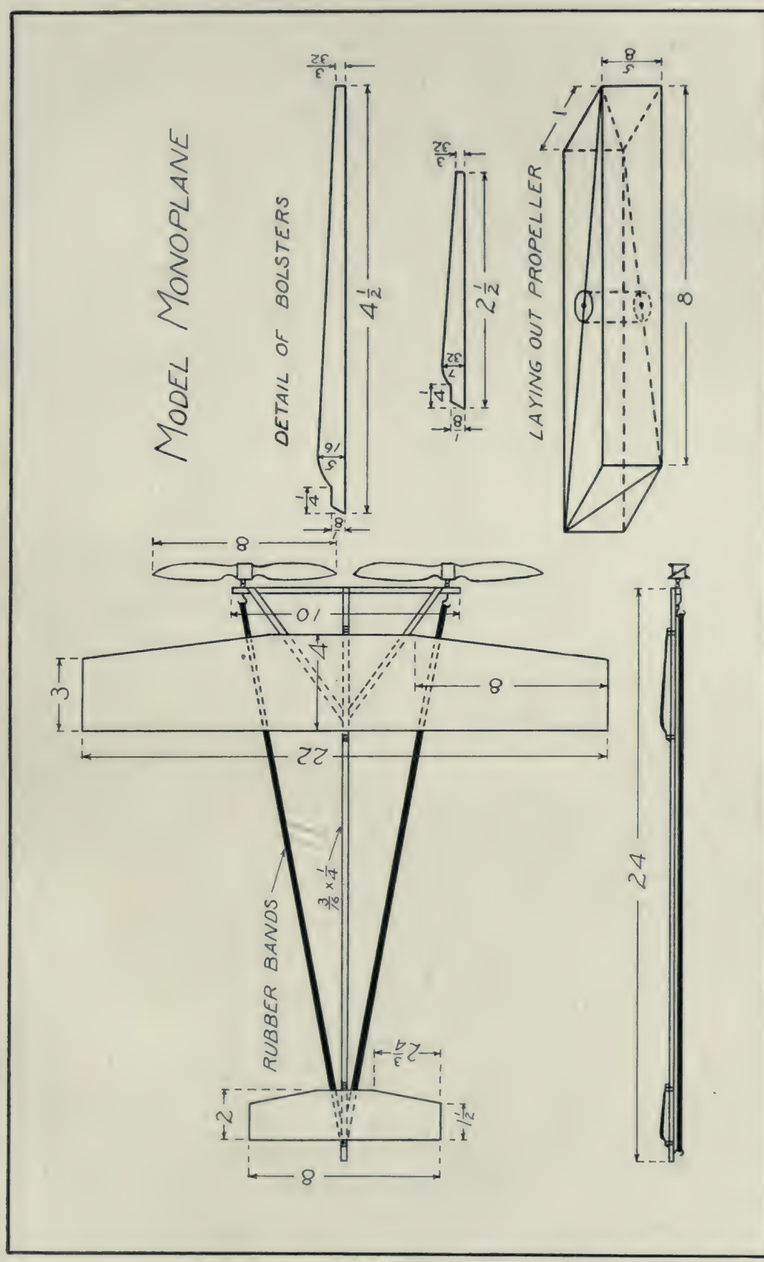
SHOP PROBLEMS

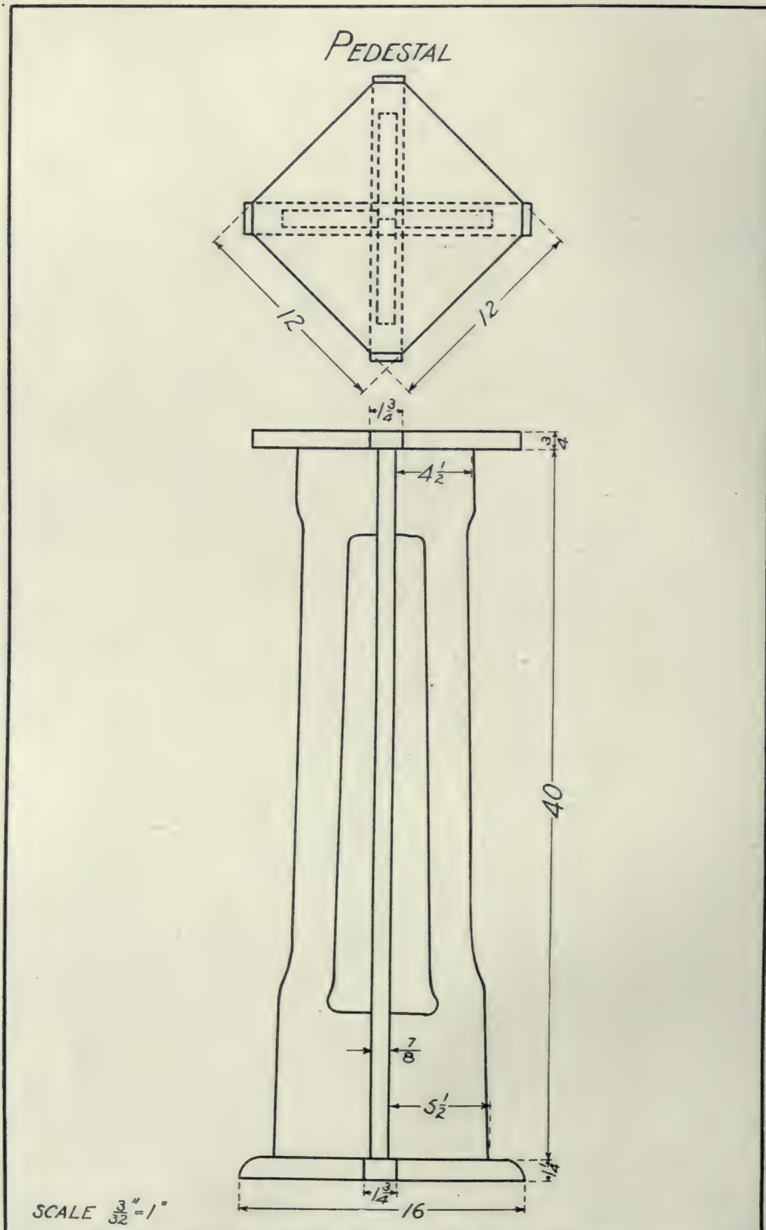
George Seaton, Editor

MODEL MONOPLANE.

With the increasing number of flights in aeroplanes the interest of the boys is being directed in many cases to the construction of models. While this kind of work may be best suited to the home, the teacher can help in many ways, as in the organizing of aviation meets, which has been done in Cleveland, and by giving a few talks to the boys upon the principles underlying the construction of a successful flyer. At first the efforts of the boys should be guided toward the simpler forms of construction as these are much more apt to be successful. As they become better acquainted with the conditions that must be met, they will be able to go ahead with more elaborate types of construction, solving the new problems encountered with considerable enthusiasm.

A form a trifle more simple than the one shown might be made by using a single propeller in place of two, but it will have the disadvantage that the machine will tend to tip because of the thrust of the propeller. This can be offset by a small weight on the opposite side. If the backbone of the machine shown should not prove stiff enough to resist the pull of the rubber bands used, a vertical strut can be added near the center of the frame and a fish line run from the front, over this strut to the rear. The rear cross-strip may be prevented from slipping forward by the use of a small angle block glued and bradded to the backbone just in front of the cross-strip. This is shown in the side view of the machine. The cross-strip is braced by two diagonals about $\frac{1}{4}$ inch wide and a full sixteenth thick. The main plane and the smaller one, termed the elevator, should be about $\frac{1}{16}$ inch thick at the heaviest part, just forward of the middle and taper to less than $\frac{1}{32}$ at the edges. The planes should be curved to fit upon the bolsters which are shown in detail. The curving can be done by steaming in front of a teakettle spout, keeping the convex side toward the steam. When the proper curvature is secured the planes are bradded and glued to the bolsters. These bolsters are just as wide as the backbone and are held in position by rubber bands passing around the backbone and the ends of the bolsters. This allows the position of the planes to be changed to secure the proper elevation in flight and makes their replacing easy in case of damage. The propellers are intended to be cut from a solid block of wood as shown in the sketch, and shaped somewhat as indicated in the top view of the machine. A light wire runs thru the center of the propeller and thru a hole in the cross-strip, ending in a little hook upon which the rubber band can be placed. To secure light running, two glass beads are placed between the propeller and the cross-strip. The bearing in the cross-strip is not particularly good and could well be improved to counteract the diagonal pull of the rubber band. Three or four strands of rubber band $\frac{1}{16}$ inch to $\frac{1}{4}$ inch wide should be used, and are held at the front upon a small wire hook. One propeller is made right-handed and the other left-handed and both are wound up with the same


MODEL MONOPLANE
DETAIL OF BOLSTERS
LAYING OUT PROPELLER
RUBBER BANDS


PEDESTAL
12
12
$1\frac{3}{4}$
$\frac{3}{4}$
$4\frac{1}{2}$
40
$\frac{7}{8}$
$5\frac{1}{2}$
$1\frac{1}{4}$
$1\frac{3}{4}$
16
SCALE $\frac{3}{32}$" = 1"

number of turns in opposite directions. In launching, the machine is held above the head with the propellers resting against the back of the hand to prevent their revolving, and a slight forward throw is given. The drawings are from a machine which weighed an ounce and a half. This is a bit light, as the monoplane is very fragile and easily damaged. The machine shown in the drawing is intended to fly to the left. By reversing the planes, it can be made to operate with the propellers ahead.

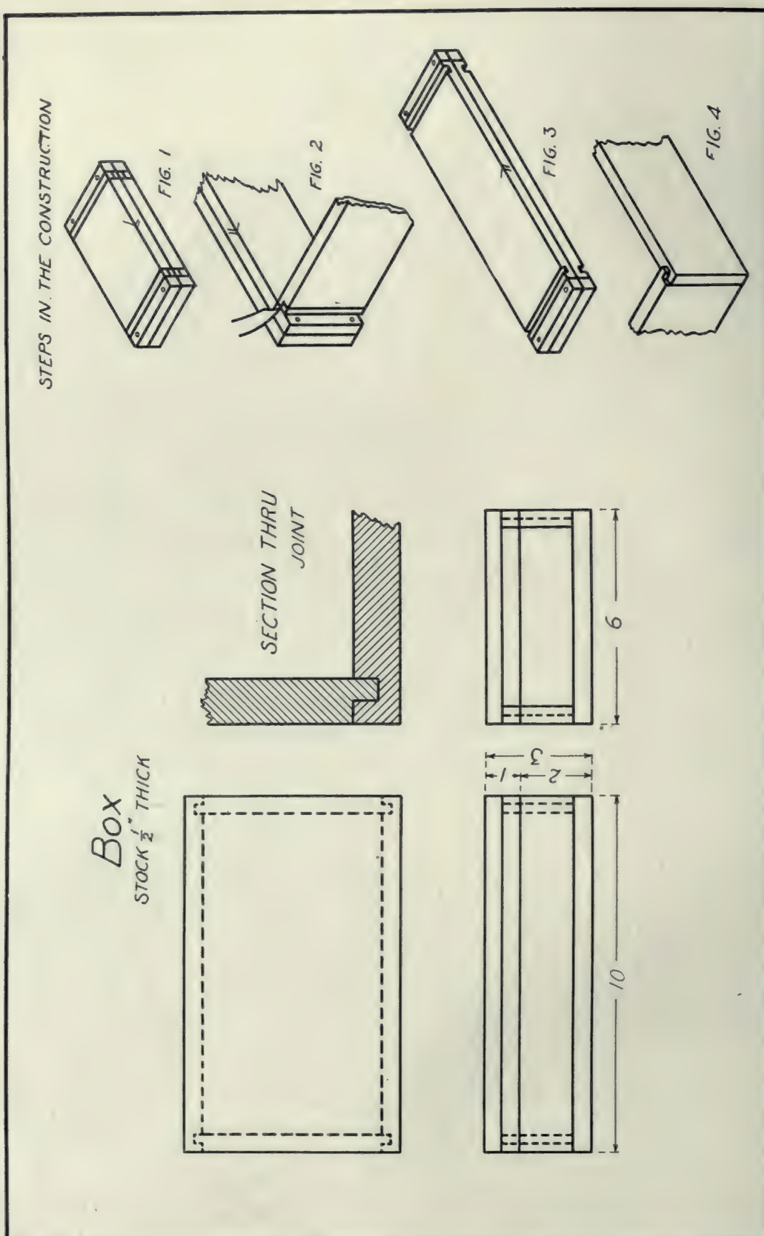
PEDESTAL.

This pedestal is one which has been made by boys in the grammar grades, Cleveland, under the supervision of Albert L. Polscher. For the upright, two pieces $5\frac{1}{8}''$ wide, and two pieces $5\frac{1}{2}''$ wide are used. The two wide pieces are first doweled together and the narrow pieces are then doweled into these. The bottom cross-piece is screwed on and the top is held in place by dowels. A variation in the design is suggested by the use of a central post to which the four side pieces are to be doweled. In this case, of course, the side pieces would all be of equal width. The post should be about $1\frac{1}{2}''$ square, and should be made to extend $\frac{1}{2}''$ below and above the opening in the center.

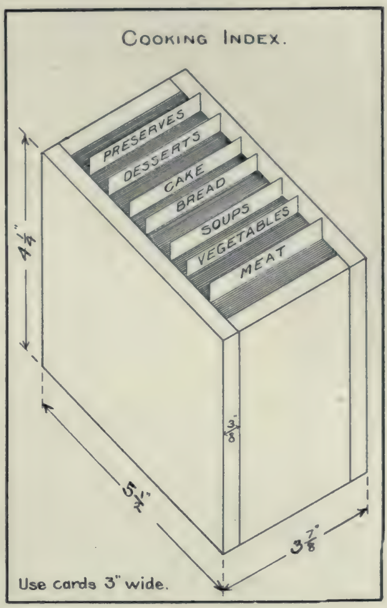
PEDESTAL.

BOX.

The problem of box construction is one which deserves a place in the experience of every boy in our manual training classes. A. W. Garritt gives an excellent analysis of the subject in the December number of the School Arts Book. Leon L. Winslow, supervisor of manual training at Niagara Falls has secured some good results along this line. The working drawing is copied from one produced by one of his pupils in carrying out one step of the problem. As presented to the class, the problem is one which may satisfy any one of a number of different needs of the boy. The box may serve for camera or electric battery, for stamps, handkerchiefs, gloves or stationery, the only limitations set being broad ones in the way of dimensions and the requirement of the dado joint. Each student determines the sizes that will suit his needs, makes a working drawing, a decorative design to


STEPS IN THE CONSTRUCTION
FIG. 1
FIG. 2
FIG. 3
FIG. 4
SECTION THRU JOINT
Box
STOCK 1/2" THICK
6
10
1
2
3

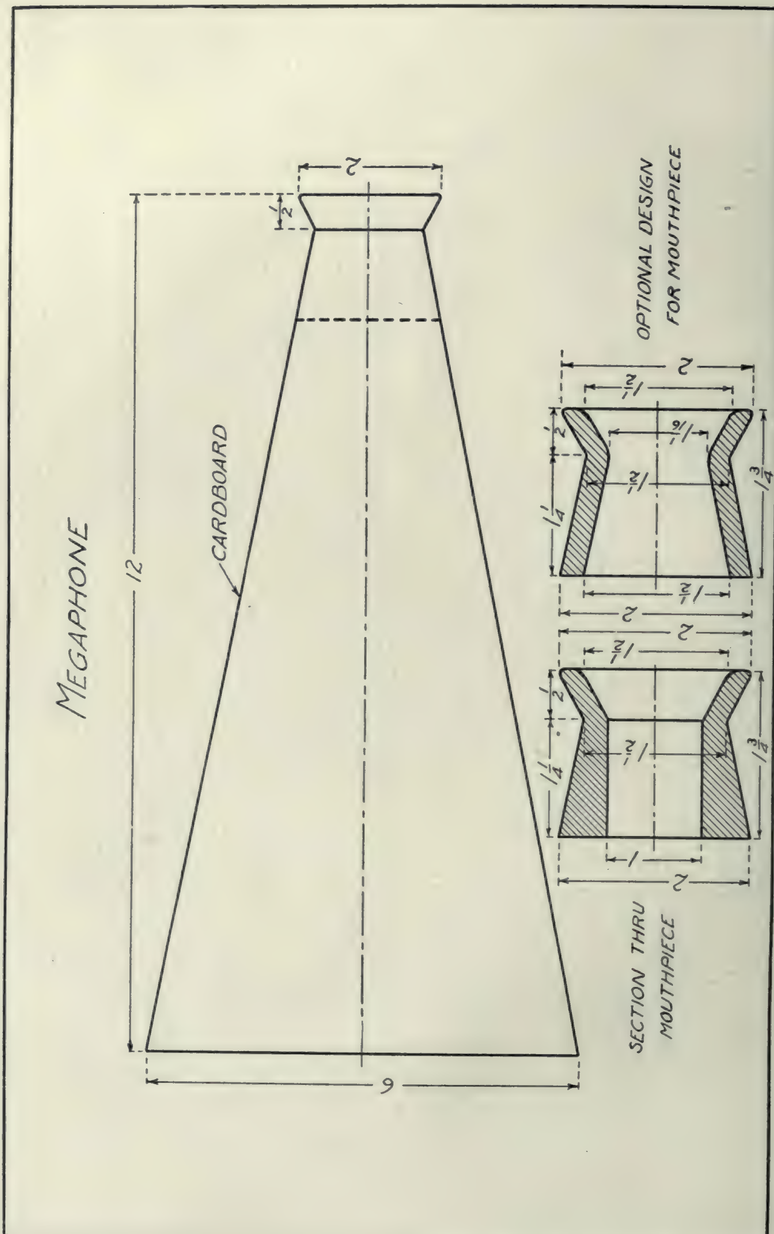
be applied to the sides and top, a perspective sketch of the finished box, and models a detail of the carving in clay. Some of the steps in the construction are indicated on the working drawing. A piece of ½″ stock is chosen sufficiently long and wide to make the sides and ends. After planing the face side and joint edge, the piece is cut into sections for the ends and sides. The ends are made 1½″ longer than the inside dimensions and the sides 2″ longer. The two sides and the two ends are nailed together with ¾″ brads placed $\frac{3}{16}$″ from the ends. By thus nailing the pieces together it becomes impossible to make the mistake of laying off any of the dimension lines where they will will show on the completed box. The ends are first laid out as shown in Fig. 1 and then sawed apart on the lines. The gage-lines for the joint are then carried across the ends of the pieces with the same setting of the gage. The sides are gaged to ¼″ more than the inside dimension of the box and then planed to the gage-lines. The lines for the joint are laid out on the sides by superposition as shown in Fig. 2. After the grooves have been cut, as shown in Fig. 3, the sides are cut off just outside of the lines and the box is ready to go together. In putting it together the fact that one edge of the ends has been left unplaned will cause the ends to project a trifle above the sides, as shown in Fig. 4. After the box has been glued together this projection can be planed off as also the slight projection of the sides beyond the ends. The top and bottom are left a trifle large, and planed down flush with the sides of the box after the glue has set. The depth of the box and the depth of the cover are gaged from the bottom and from the top of the box, the box is sawed apart between these gage lines and the rough edges left are planed to the lines. The box is now ready for hinges and lock, for the final decoration, and the finish.



In connection with this problem is shown a box suggested by Henry W. Leland of Leominster, Mass. The box made by his boys takes the form of a container for cooking recipes, which makes a "cook-book" far more flexible and valuable than the old time form.

MEGAPHONE.

This is a project which approached quite close to the ideal in the way in which it solved itself after once being suggested. Perhaps its success was partly due to the fact that it was begun during the football season. The dimensions given


MEGAPHONE
CARDBOARD
12
9
2
OPTIONAL DESIGN
FOR MOUTHPIECE
SECTION THRU
MOUTHPIECE

are those decided upon by the boys of East Cleveland. Two designs for the mouthpiece are given, the first being planned for mandrel turning, while the second must be turned upon screw and cup chuck. In either case it is well to have the wood of the part away from the mouth sufficiently heavy to carry the tacks which hold the cardboard in place. The need for a pattern for the cardboard taught more about the theory of development than is ordinarily possible by any amount of talk on the teacher's part, while the desire for the display of the school colors and name upon the cardboard gave an incentive for work in applied design and lettering. Enough cardboard was allowed for a lap to be fastened together with brass paper fasteners or a lacing of ribbon.

BOXES WITH INCISED DECORATION.

CURRENT ITEMS

CENTRAL STATES.

The most interesting and vital topic for educators is the question as to whether the capacity acquired in one study can be transferred to another. It would seem from the experiments that have been observed that so far as the subject matter is concerned it cannot be transferred, but so far as capacity is dependent upon the method pursued in the study, it is transferable to a considerable extent to studies in which the same method is used. So far as it is concerned, with the amount of intensive work put into a subject, the capacity acquired is transferable to an indefinite amount.

A. LAWRENCE LOWELL,
President of Harvard University.

NORTH ATLANTIC STATES.

Thru the death of Mrs. Mary Hunt Loomis of Chicago sufficient funds are now available for the establishment of Loomis Institute on the site of the old Loomis homestead in Connecticut. The estate of Mrs. Loomis is estimated at approximately $1,500,000. and the trustees previously had $600,000. Loomis Institute had its beginnings in a compact entered into more than thirty-five years ago by four brothers and a sister. All possessed considerable property but none had children to inherit it and it was agreed that the wealth of each should be willed to Loomis Institute which should take the place of sons and daughters in the perpetuation of an honored name. It is expected that the school will possess many features similar to Pratt Institute and Simmons College. Applicants for admission as students must be between twelve and twenty years of age. That the technical side will be emphasized is apparent from the following statement made by John M. Taylor of Hartford, the president of the board of trustees, "So far as we are now able to foresee, the children and youths which may be entrusted to Loomis Institute will go out from it equipped to win their way in the world, with both head and hands." It is expected that Loomis Institute will have the moral and financial support of all the members of the Loomis family in America.

"To furnish education in the mechanic arts for young men in Massachusetts" was the aim of Arioch Wentworth in leaving $3,500,000 for the establishment of Wentworth Institute in Boston. This school which is to be under the principalship of Arthur L. Williston formerly of Pratt Institute, will occupy a beautiful site on Huntington Avenue nearly opposite the new Museum of Fine Arts and not far from Simmons College.

In a recent statement concerning the propose and scope of the institute Mr. Williston has said that the school is to train young men for a higher degree of efficiency in the mechanical trades. It will offer a limited number of courses two years in length, and a larger number one year in length. Mr. Williston says that the boys who enter Wentworth Institute will in the main come from

the great army who leave the public schools at the end of the compulsory school period and therefore do not enter high schools. Many of them will be boys who have entered unskilled occupations and then finding the opportunities for advancement too few and too uncertain, will be glad to turn back to the school that will offer them instruction of such a practical character that they can immediately use it in obtaining a higher grade of employment. It is therefore expected that many boys will enter Wentworth Institute with some practical experience in earning a living.

A significant part of Mr. Williston's statement refers to the methods of instruction. The school will aim to avoid all work that gives merely a superficial knowledge of shop methods. On the other hand, each of the courses offered will include instruction in the principles of applied sciences which are essential to the thoro understandng of trade processes, and the curriculum of the school will provide time for instruction in laying out work, in mechanical drawing, in trade computation and estimating, in the nature and physical properties of the materials used, in practical mechanics, and in any other special branch of applied science that may be necessary to a truer understanding of any particular trade.

Nevertheless, the greatest amount of time and the greatest emphasis will, in every trade course, be placed upon the doing of things—upon the actual handling of tools and machinery, and the production of concrete practical results.

At a recent meeting of school superintendents of Massachusetts held at Worcester a resolution was passed from which we quote the following: "Resolved, That the Massachusetts Superintendents' Association believes in the education of the hand as well as of the brain.

"That we are in sympathy with the efforts of the State Board of Education to extend industrial education in Massachusetts, especially to increase the opportunities for better training for efficiency of pupils between the ages of 14 and 16, and that we pledge to that board our hearty and cordial cooperation in these efforts."

Governor Aram J. Pothier of Rhode Island has recently made some significant statements concerning manual training. He says, "The past year has seen many converts among educators to the idea of elementary manual training in the lower grades. The same is true regarding agricultural courses." Again he says, "It is right that we should concern ourselves deeply with the practical side of education, but it is vital that the higher aim of the school should not be overlooked. While we are training the mind and hand of the child to useful material ends, we must be certain that we are also training the heart and developing the moral sense to the highest possible state."

Some thoroly artistic printing is being done in the school print shop of the Norwich Academy, Norwich, Conn., under the manual training instructor Frederic H. Canston. The print shop, which he calls the Academy Press, has

issued an excellent booklet entitled "The Inland City," a letter and poem by Edmund Clarence Stedman. The drawings for the illustrations were made by the Norwich Art School. In typography, presswork and binding, the booklet displays work excellent in quality. Another booklet from the same press is a descriptive circular of the Norwich Art School illustrated with half-tones.

One of the latest developments in vocational education in Boston is the opening of a course for janitors in the Mechanics Arts high school building. This school is an effort to enable men now in the service to receive instruction which will make them more efficient in their work, and help them to earn higher grade liscenses under the school committee of Boston.

At a recent meeting of the Vermont State Grange the subjects of agricultural education and conservation were considered in the annual address of the state master, C. F. Smith. He pointed out the great need of the conservation of soil fertility, which led him to recognize the great need of more practical education for the farmer. He said that we should teach our boys not only how to make two blades of grass grow where one grows now but how to grow four blades in the place of one; also how to make one blade give the net profit for the two or four blades. He spoke of the agricultural college as doing excellent work in all that it was designed to do, but pointed to a missing link between the college and the district school. He then proposed an agricultural high school for every county in the state. This should be in connection with a demonstration farm so that boys in the school could not only learn the science of agriculture but also how to apply each principle learned. He would have a department where girls, could be taught the art of housekeeping and home-making. In other words, Vermont is beginning to wake up to the need of agricultural and manual arts high schools similar to those already established in Minnesota and Wisconsin.

From October 3d to October 28th, New York City presented to its citizens a huge collection of charts and statistical diagrams, and models of all kinds. This was dubbed a Budget Exhibition from the fact that the material had been gathered together to show the people of the city how their money is spent. Estimates of the amounts needed by the different departments for the year to come was explained by the head of each department thru a number of striking and ingenious devices.

The Board of Education, with its request for nearly thirty-six millions of dollars, was given a large share in the Budget Exhibition, that it might explain how it was going to spend this staggering sum. Its explanation was made up of a great collection of facts, figures, and concrete results. Over eighty charts explained in detail what was needed in the way of increased funds for day schools, evening schools, vacation schools, shops, kitchens, and the like. The two new vocational schools, for boys and girls, made extensive showings of their work. The supply department covered many tables with examples of the different materials furnished to the schools, and showed the economical fashion in which

these were procured and distributed. The truant school, the school for the deaf, the classes for defectives and classes for the blind also had a chance to make their appeals in concrete fashion.

The booths which held these different exhibits were lined with photographs. Over four hundred of these pictures served to show the activities of every part of the system from the open-air classes on the ferry-boats to the truant farm. This pictorial showing was unique. It represented the largest exhibition of photographs of the city's school work which has ever been shown. Thru it visitors could secure in a few minutes, a view of the system from the kindergaretn to the highest classes of the high schools.

Considerable space was given to the manual arts, and many charts explained the reasons why more shops and kitchens, and additioanl work in domestic art, should be provided. These charts were supported by appealing illustrations of the good work done. The large photographs showed the children at work, and the booths themselves were filled with the products of their labor. The latter included, for the boys, substantial pieces of furniture, and for the girls, many interesting examples of practical dressmaking and millinery, together with a toothsome exhibition of things cooked in the school kitchens.

Many thousands of citizens visited this exhibition. On certain days it was estimated that not less than 20,000 persons had passed thru the halls. As an object lesson in the work of the city and in explanation of the complex machinery needed to run a great municipality, it proved most instructive and illuminating. There was perhaps no more interesting illustration of the attention and respect which it excited, than the attitude of the public toward the educational showing. In the month during which the show was open, an army of people, including large groups of children from the schools, crowded to the utmost the aisles and booths of the school department. In all that time, not a chart or diagram was wantonly injured, and the cakes and goodies of the cooking classes lying open upon the tables, were untouched of eager hands.

Dr. William H. Maxwell, superintendent of public schools in New York City in his last report recommended that sewing and cooking be taught to all girls in the seventh and eighth grades and that all girls over twelve years of age be taught to cook. To carry out this plan in 1911, Mrs. Mary E. Williams director of department of domestic science, will need twenty-five additional teachers. This will bring the total number of cooking teachers up to more than one hundred and fifty. Last year the number of sewing teachers in New York City was sixty-one and the number of shopwork teachers eighty-one.

Milton E. Hershey, "the Chololate King," for whom was named the town of Hershey on the Reading railway, a few miles out of Harrisburg, Pennsylvania, is establishing an industrial school for orphans. The plan of the school is similar to that of Girard College of Philadelphia. Boys will be taken when only six or eight years old and will remain in the school until they are eighteen, or until they can support themselves. At first the school will occupy the old Hershey homestead, but it is the intention of the founder to enlarge the school

PART OF EXHIBIT OF VOCATIONAL SCHOOL FOR BOYS, NEW YORK CITY BUDGET EXHIBITION.

from time to time as the number of applicants increases. In order to do this he has turned over to the trustees five hundred acres of land for the purpose of the school. Agricultue will be one of the pominent studies in the school. George E. Copenhaver, at present superintendent of farms for Mr. Heshey, will be superintendent of the new school.

SOUTH ATLANTIC STATES.

In an effort to make more effective the industrial side of the work of the McKinley and the Armstrong manual training schools in Washington, D. C., a plan has been proposed which involves changing the instruction and methods to suit the needs of pupils desiring to enter upon a trade immediately after graduation from the schools. It is proposed that both institutions give courses equivalent to an apprenticeship in a trade shop and to do this without omitting the fundamentals of a good general education. The high efficiency of these manual training schools in their present form is recognized, but they do not afford the opportunity that is desired for the development of skilled workers. It is pointed out in this connection that the manual training school is not doing for its students what the business high school is doing thru the preparation of stenographers and bookkeepers, who are made ready for immediate employment. Moreover, it is believed that many seventh and eighth grade pupils who now leave school could be induced to remain longer if more definite technical instruction were given in these high schools.

It has been estimated that the total cost of building and maintaining a battle-ship for twenty years, the estimated life of such a ship, is about thirty-two million dollars. In order to make clear what this means, the *Wheeling Register* has estimated that the cost of each ship would buy eight thousand farms at $4,000 each, or would construct 1,600 churches at an average cost of $21,000 each; it would build and equip fifty manual training schools with the tools and appliances necessary to teach useful trades to 75,000 young people each year; it would build a macadam road from New York to Chicago; or it would build and equip forty magnificent Y. M. C. A. buildings.

NORTH CENTRAL STATES.

The city of St. Paul, Minnesota, has opened industrial classes for backward boys in two of its grammar school buildings. These classes take boys who are slow in their school studies, place them under a man teacher and enable them to pursue a course which shifts the emphasis from the cultural to the practical. Half of the day is devoted to academic subjects and the other half to the manual arts, including especially mechanical drawing. The number of students in the school is limited so that the teacher may have an opportunity to study the needs of each individual boy. The aim is to allow each pupil to develop in a rational way. Superintendent Heeter's idea in establishing these classes is not to bring boys back to grade so much as it is to help them to find out their aptitudes and prepare them for real work in the world.

PUBLIC SCHOOL COOKING (DOMESTIC SCIENCE) BOOTH ON LEFT, SEWING (DOMESTIC ART) ON RIGHT, NEW YORK CITY BUDGET EXHIBITION.

The Chicago Normal School is to have a new arts building in the near future. In external appearance it will probably be almost a duplicate of the present practice school building. It will be placed at the east end of the main building, and connected by a bridge. The arts building and a new gymnasium, which will be constructed at the same time, will together cost about $350,000.

Just out of Rockford, Ill., there are four districts, the school houses all located on an interurban line. These have consolidated, voted to build a house costing $18,000 on the site of the old Free Soil School. The site contains three acres. The building will be steam heated with fan ventilation. It will contain water and plumbing and electric lights. A full high school course will be offered. manual training, domestic science and agriculture will be taught. There will be an enrollment of 125 pupils. Only teachers trained in normal schools or colleges will be employed. The people mean to have the very best facilities for their children. Are there not other districts situated along electric lines that could do likewise?

From the Press Bulletin issued by the state department of public instruction in Illinois, we learn that the number of schools maintaining manual training courses has increased from 78 to 97 during the past year, and the number of schools maintaining domestic science from 55 to 75.

The sub-committee appointed by the Illinois Educational Commission to draft a report on the teaching of manual training, domestic science and agriculture in the public schools of the state has presented its report to the Commission. This report represents one of the most thorogoing efforts ever put forth in Illinois to make a study of what is desirable and what is possible in the way of offering instruction in these subjects in the common schools. In time the report will be printed for distribution.

Cincinnati reports success with its construction schools. The instruction is being given by "practical men right from the shops," and the trade unions are in favor of the schools. An enlargement is contemplated.

Superintendent Davidson of Omaha, Nebraska, is placing special emphasis on the need for more practical education thru manual training, including cooking and sewing. The *Omaha Bee,* in a recent editorial on vocational training, is seconding the efforts of the superintendent. The editorial closes with the following: "Our educational system should be so arranged as to furnish the greatest possible liberty of choice to the individual along with the most thoro training in the fundamentals of both mental and manual usefulness." The editorial further points out that the question to be determined is not whether we should have vocational training, but when it shall begin. "Experience has proven" that a large percentage of children attending public schools, do not advance beyond the 7th or 8th grades. This would seem to indicate that there is where this training is

most needed. "The manual training high schools are doing excellent work in their way but they are part of the higher educational system. The children who drop out of school after they have finished the grammar grades, get no benefit whatever from the manual training given in the high school, and they are really the ones it is desired to reach by vocational training."

WESTERN STATES.

Acting in accordance with a resolution passed by the county superintendents of Utah at a convention held in Salt Lake City last April, a committee of these educators, including State Superintendent Nelson, has recently completed a revision of a course of study for the public schools of Utah. The revision applies to courses in all state schools outside of cities of the first and second classes and in country districts of the first class. By it more stress is to be laid on manual training and domestic science courses, which the committee believes should become an important factor in the elementary schools thruout the state. The new course also makes recommendations intended to modernize the methods of teaching in the elementary grades.

The city of Chico, California has just completed a thoroly modern school building in which there is space for manual training shops, bath room, print shop, and club rooms, in addition to the classrooms. The school has the use of a large tract of land which will be farmed every year by the pupils. All students receive instruction in agriculture. Some students have individual plots of land to look after while others work on the community plan. They seem to be getting their little farm down to a paying basis and market their crops in a businesslike way. They not only sell the garden truck to their parents, but they also dispose of a considerable amount to the local merchants. A school bank with a student office force takes care of the money, loans cash on notes when necessary and goes thru all the regular banking forms, giving experience of the right sort to both students comprising the office force and those appearing in the capacity of depositors and patrons.

CANADA.

In Winnipeg two new centers have been opened recently, and the corner stones of two new technical high schools have been laid. These two schools when equipped will cost over $800,000. They will be used for trade school teaching in the evenings.

Edmonton, Alberta, has three manual training centers, each provided with twenty woodworking benches and all necessary tools. Clay modeling, paper and cardboard construction, sewing, weaving, and basketry of native willows are given in the lower grades. Alberta is remodeling its courses of instruction, and it is expected that manual training will be placed on the grant-earning list.

The Royal Commission on Industrial Training and Technical Education has completed its tour of Western Canada and the Pacific Slope states having covered about one hundred cities and towns and taken testimony of some fifteen hundred witnesses since the first of November. The Commissioners report that everywhere they have found a great recent development of interest in educational matters generally and particularly in technical education. The Commission will sail for Europe late in February and will spend approximately two months in Great Britain, one month in France, one in Germany, and one divided among the smaller countries.

ENGLAND.

The genial editor of *Manual Training,* H. Williams, Smith, has recently been selected to establish manual training work in the Commercial Travellers' schools at Pinner in Middlesex. These schools prepare solely for commercial pursuits, but are desirous of having the best of manual instuction for its general educational value.

James T. Baily of St. Albans has resigned the business managership of *Manual Training* and accepted an associate editorship on the same journal. He will take charge of the examination department and the "Model of the Month."

The death of John H. Naylor in October removed one of the most active of the London teachers of manual training. For about nine years he has been associated with Evan Ortner in the manual training works at the Royal Military Academy, Woolwich. Last summer he was the director of the school for teachers at Brighton. He was at one time the secretary of the London branch of the National Association of Manual Training Teachers, and later the general secretary. He was a member of the examinations board of the National Union of Teachers.

REVIEWS

Principles of Educational Woodwork. By Charles S. Binns and Rufus E. Marsden. Published by J. M. Dent & Co., London, and E. P. Dutton & Co., New York, 1909 7½ x 5in.; pp. 310; price 5s. net.

This epoch-making book which recently came to my desk has been read, and part of it re-read, with the greatest interest, and having found it worth while I shall carefully study the chapters on pedagogy till the authors' methods become fully assimilated.

The aim of the book is not the giving of information about tools and processes, or a "subject content" for manual training teachers, but rather the pointing out of scholarly and practical methods of teaching from the psychological side. And best of all, it is not written by a psychologist, but by experienced manual training men who are evidently skilled and have knowledge of tools and processes, and besides all this, know how to apply the best educational methods to shopwork. Up to the present time but little has been printed in book form on the pedagogy and psychology of manual training that is concrete enough to be really helpful to the handwork teacher. This book will be of special benefit to young teachers, and in fact to any one who has not made a long study of the best methods of class instruction in shopwork.

In the United States there are at least four types of demands upon the manual training teacher which are very difficult to harmonize. These may be classified as follows:

(1) Demands from school boards for "so called" practical work, meaning repair work, and construction of articles useful to the school district (making a logical course impossible).

(2) Strong demand for trade instruction.

(3) Influence of the artists who claim that design should be basic, and that a feeling for form, outline and decoration is more important than sequences of tool processes.

(4) The demand of the psychologists who claim that handwork has no place in schools unless it has a "subject content," and that courses must be arranged in progressive steps which will excite the instincts which give impulses to action; mainly, play, curiosity and ownership.

The authors ignore the first demand, probably because if carried to an extreme it has proved a failure sooner or later wherever tried. They have little to say about trade or industrial education, important as they may be, most likely because they do not consider it the same as manual training, and realize that trade or industrial work can be profitable only where considerable time can be given to it, obtaining skill by repeating the processes or by using factory methods. Such work is for special schools and is of little value to any except those children who are to go into the industries. The value of art or design influence is emphasized as being very important, but the greatest stress of all is put upon lesson plans and the proper development of each process. Methods of class teaching are illustrated and little is said about individual teaching. Manual training teachers

who use the individual method will be agreeably surprised at the benefits that come from class teaching, and this book shows how the latter method can be used.

The chapters on motor training, interest and attention are written from the view point of experienced manual training teachers. The authors take the ground that the work given to the child should interest him as much as possible, and his attention will be greatly increased thereby.

The chapter on discipline ought to be read by every manual training teacher as it is full of helpful suggestions. The few paragraphs in the chapter on the teacher are only too short, and contain a list of books dealing with methods of education, child study, psychology and manual training.

Two chapters are given to trees and timber, one to tools and materials, another to drawing, and the last to suggestions for bench work in wood, with a large number of working drawings in the back of the book. The last few chapters are not of especial interest to Americans, having been written for the teachers of England where the conditions are somewhat different in many respects from our own.

I believe that this book will be much used by classes in manual training organization in our Normal Schools and Universities in the near future, and will find a place in the library of every manual training teacher. Superintendents, principals and members of school boards would be wiser, more practical and helpful if they would read the first few chapters,—but this is only a dream, not to come true in these busy days. A. C. Newell.

Director of Manual Training, Illinois State Normal University,
Normal, Ill.

Elementary Cabinet Work. By Frank Henry Selden. Rand, McNally & Co., Chicago, 1909; pp. 278; price, $1.00.

This book covers the general principles of furniture construction as dealt with in the manual training shop. It is intended to be placed in the hands of each pupil and presupposes on his part a knowledge of the correct use of common woodworking tools.

Part I deals in a general way with the various joints, forms of construction, and methods of working applicable to furniture making in a school shop. Part II deals with type forms of cabinet work, showing working drawings and illustrations of finished pieces such as stools, tables, cases, cabinets and frames. Part III describes briefly some of the tools and materials necessary for cabinet work that would not ordinarily be used in elementary woodwork.

The book is profusely illustrated thruout, showing completed models and representing the steps and processes in laying out, cutting, fitting and assembling various types of cabinet work. The directions for the use of tools and methods of construction described, tho appearing to be somewhat individual at times, are thoroly workmanlike in character and clearly and concisely written. For the sake of the technical infomation contained in the book it would be of great value in the hands of any pupil.

Some of the drawings are disappointing in regard to technique and the illustrations are not all as clear as might be desired. A statement in the introduction implies that design is to be taught thru the variety of designs presented and

the sugestions for new forms and combinations. Some of these suggestions are loose and misleading, as for example the following, "The use for which the box is made determines the dimensions of height, width, and length. There are no set rules. The nearer the box is to the form of a cube, the more it will hold for the amount of material on the outside." Clearly the suggestions regarding design are made from the standpoint of the factory designer rather than from that of the craftsman or artist.

LOUIS F. OLSON,
Director of Manual Training,
Madison, Wis.

RESERVED FOR LATER NOTICE.

The Essentials of Character. By Edward O. Sisson, professor of education, University of Washington, published by the Macmillan Company, New York. Price, $1.00.

The Flush of Dawn. By Henry Turner Bailey, editor of the *School Arts Book,* published by the Davis Press, Worcester, Massachusetts. Price, $1.25.

Carton Designing for Juniors. By Joseph Henry Judd, superintendent of handicraft, Manchester, England, published by E. J. Arnold & Son, Leeds.

RECEIVED.

Technical Training in the Berkeley High School. By Charles S. Evans, director of the department of mechanic arts, Berkeley, California. A small pamphlet discussing high school manual training work and showing boys at work building and equipping a workshop.

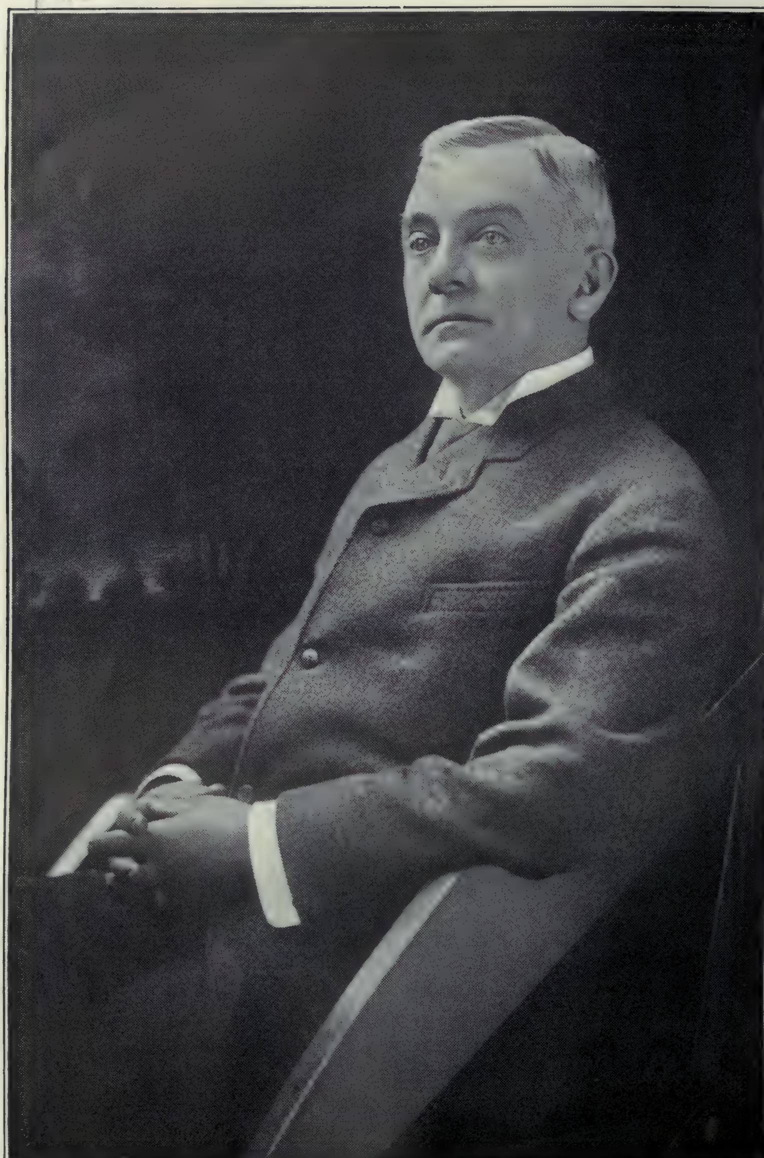
Glamorgan Summer School. A. Sutcliffe, organizer, Barry, Wales.

Report of Commissioner of Education. Volume 1, 1910. Bureau of Education, Washington, D. C. Contains a chapter on industrial education in the United States, a chapter on the Prussian system of vocational schools, one on agricultural education, and several other chapters of interest to students of present day problems in education.

Manual Arts Number of Bulletin of State Normal School, Plattsville, Wisconsin. V. M. Russell, instructor in manual arts. An illustrated circular giving many problems in manual training which correlate with science instruction, engineering, sports, and life on the farm.

Sloyd Training School, Boston, Massachusetts. Circular for the twenty-second year of this famous school directed by Gustaf Larsson.

Legislation upon Industrial Education in the United States. By Edward C. Elliott, professor of education, University of Wisconsin, and C. A. Prosser, deputy commissioner of education in Massachusetts. This is bulletin No. 12 published by the National Society for the Promotion of Industrial Education, and is a most comprehensive and helpful publication on the subject. It contains a table giving a comparative analysis of state legislation on industrial and trade education in Massachusetts, New York, Connecticut, Wisconsin, Ohio, and New Jersey.



THE LATE SENATOR JAMES H. STOUT, OF WISCONSIN

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COOPERATIVE PLAN FOR WOODWORK IN RURAL SCHOOLS.

CLINTON S. VAN DEUSEN.

With Drawings by Edwin V. Lawrence.

IN considering the need of manual training in rural schools, it may be said that manual training would give boys new interests and tend to keep them on the farm; it would keep more boys in school. Farm work needs system, and manual training would help to develop it. Modern farm machinery requires technical knowledge such as is gained in manual training work. It is not, however, the purpose of this paper to discuss the need of manual training, but rather to take for granted that this need is recognized by those who have given thought to the matter, and to offer a practical plan for carrying it on.

Few people realize how strenuous is the day's work of a rural school teacher, and how unsatisfactory are many of the conditions under which she works. Any plan which materially adds to her labors is out of the question, especially when we consider that about fifteen per cent of such teachers have received less than a high school education and more than ten per cent of them are teaching without previous experience. Of course, it is not impossible for some of the stronger or more experienced teachers, or for those working under the best of conditions, actually to carry on some manual training work without assistance. Instances can be referred to where excellent work is now being done, but this is the rare exception and cannot soon become the rule. The purpose in presenting the plan outlined in this paper is to suggest a means by which woodworking can be given where it is most needed, that is, in the less favored schools.

In preparing the data given below I was assisted by W. C. Cushing, a student at Bradley Polytechnic Institute. He became so much interested in the subject that he finally selected it for his graduating thesis, and tried out the plan in a one-room country school. The selection of Mr. Cushing to assist me was indeed fortunate, as he was able to bring to the work experience both as a pupil and teacher in rural schools, also experience as principal of a graded school.

In considering how to present the subject, it was decided that it would be better to work out a definite plan that could be followed under somewhat unfavorable conditions than to confuse the subject by experimenting with several plans that might be followed under various conditions. Teachers working under better conditions can easily extend or modify the plans proposed for the less favored.

The essentials of the proposed plan are as follows: A director is to be employed for twenty-five schools. He is to visit each school once a week, directing and criticizing the work of the boys, who do most of their work when the director is not present, working from illustrated typewritten or printed instructions. The director is also responsible for planning the course and providing material, and has general care of the equipment. By this plan the regular teacher's work is certainly not increased and by interested cooperation with the director, her cares may be considerably reduced.

The following are possible schedules for the director and the boys, but of course these would have to be rearranged to meet different conditions.

Possible schedule for one day's work of Director—

8-9 A.M.	10-11 A.M.	12-1 P.M.	2-3 P.M.	4-5 P.M.
1st School.	2d School.	3d School.	4th School.	5th School.

Possible schedule for five boys, A, B, C, D, and E—

	8-9 A.M.	12-1 Noon	4-5 P.M.
Monday	A	B	D
Tuesday	B	C	E
Wednesday	C	D	A
Thursday	D	E	B
Friday	E	A	C

It will be noticed that the vital part of the plan is the director. He should be a good, enthusiastic teacher, altho most of his teaching is done thru the typewritten instructions which the boys follow. He should be a good organizer and manager, so that the work will move along promptly and smoothly without delays such as might be caused by

lack of equipment or material. He should have a thoro knowledge of woodworking and of the tools used in the work, and should be really in sympathy with the boys and their life on the farm. Of course it will be difficult to find men filling all of these requirements until steps are taken to prepare teachers for such work.

In studying the question of equipment for the work, considerable thought has been given to designing a low-cost bench. A working drawing of this bench is given in Plate I. It is made of such stock material as could be secured from any lumber dealer and it is simple in construction. The vise, which is very often the expensive part of a bench is made with a five cent wing-nut bolt, and the entire material used in making the bench should cost less than one dollar. In using the vise it is clamped as tight as possible by turning the wing-nut and then a further tightening is accomplished by pushing down the lever which is fastened to the head of the bolt. The bench has but two legs which support the front of it, and provision is made for screwing the back of it against a wall. Under some conditions it might be advisable to place it in the schoolroom but often a better place can be found in the coat-room or elsewhere. This bench with the tools listed below provides an effective equipment for carrying on the proposed work.

EQUIPMENT.

Bench.
Handy saw—Bishop.
Brace.
One each, auger-bits—3/16″, 3/8″, 1″, 1½″.
Bit-stock drill 4/32″.
Countersink.
Sloyd knife.
Jack-plane—Stanley No. 5, with extra iron for each pupil.
Block-plane—Stanley No. 9½.
Hammer.
Try-Square.
Marking-gauge.
Screwdriver.

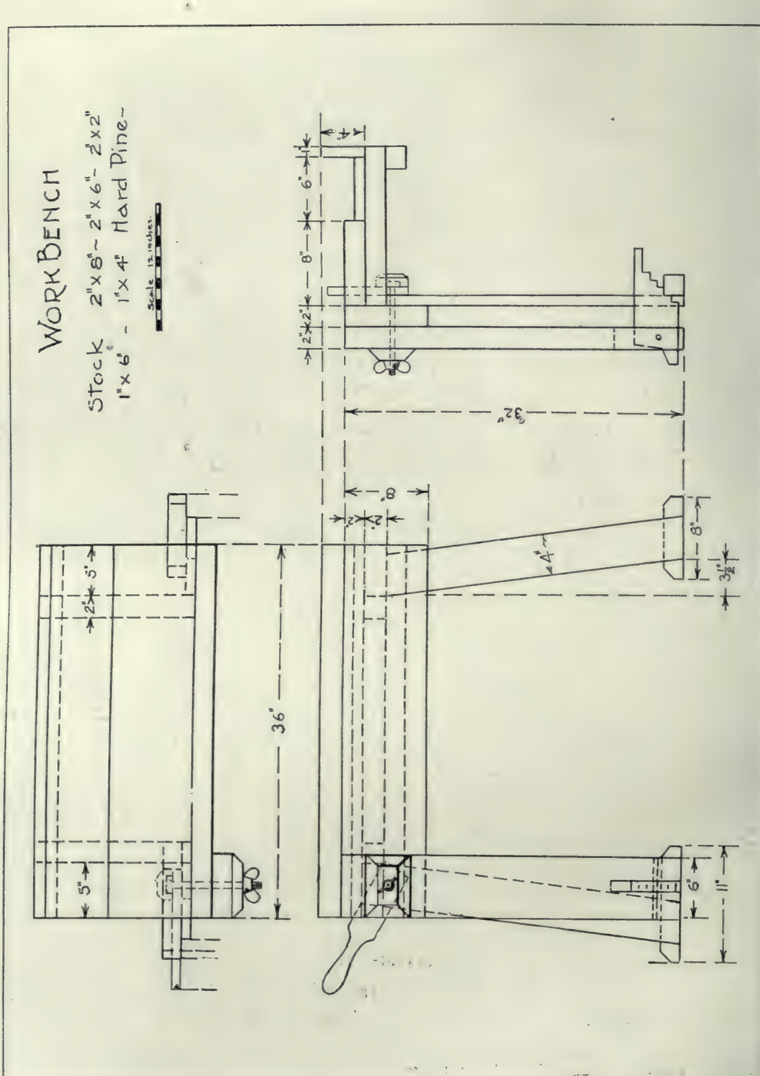

Work Bench
Stock 2"x8" - 2"x6" - 2"x2"
1"x6" - 1"x4" Hard Pine -
Scale 12 inches.
36"
32"

PLATE I.

Foot rule.
Spokeshave—Stanley No. 54.
1 ″ Firmer—chisel.
¼″ Firmer—chisel.
1 ″ Firmer—gouge.
Combination oilstone—India No. 029.
Bench-hook.
Bench-brush.
Planing support.
Winding sticks.
Dowel-plate.

In planning the course it is not necessary that all, or even most, of the earlier models be distinctively farm models, but they should be such as will be of real interest to the boys and should involve fundamental tool processes which the boy may use later in making things for the farm. It should, however, be remembered that a large part of the value of this work is the training the boy receives in doing things in a systematic and orderly way. System in doing things is a fundamental habit that should be cultivated in boys that they may be effective workers in their later life. Few, if any, other school subjects offer so good an opportunity for this training as woodworking. The course as outlined below is suggestive but need not be followed. Any course should, however, be as carefully planned as this one. For the eighth grade the work has not been outlined, but it will be noticed that in the list of suggested models a larger number are directly connected with farm life.

PROPOSED COURSE FOR SEVENTH GRADE.

Models.	Tool Processes.	
1—Peck crate	Measuring	Prepared stock.
2—Marble-board	Knife lining	
3—Bird-house	Crosscut-sawing	
	Nailing	
4—Gobang board	Gaging	Prepared stock.
5—Counting board	Boring, peg-making	
6—Window stick	Rip-sawing	
7—Rope wind	Free planing	
8—Coat-and-hat rack	Accurate planing.	
9—Stirring paddle	Simple modeling, sanding.	
10—Pen-tray	Gouging.	
11—Broomholder	Vertical chiseling, use of screws.	
12—Windmill	Simple joinery.	
13—Milk-stool.		

SUGGESTED MODELS FOR EIGHTH GRADE.

Dibble, hygroscope, hatchet handle, swingletree, trestle, sled, saw-buck, chicken-coop, chicken-feeder, egg-tester, snow-plow, garden marker, dog-kennel, wagon-jack.

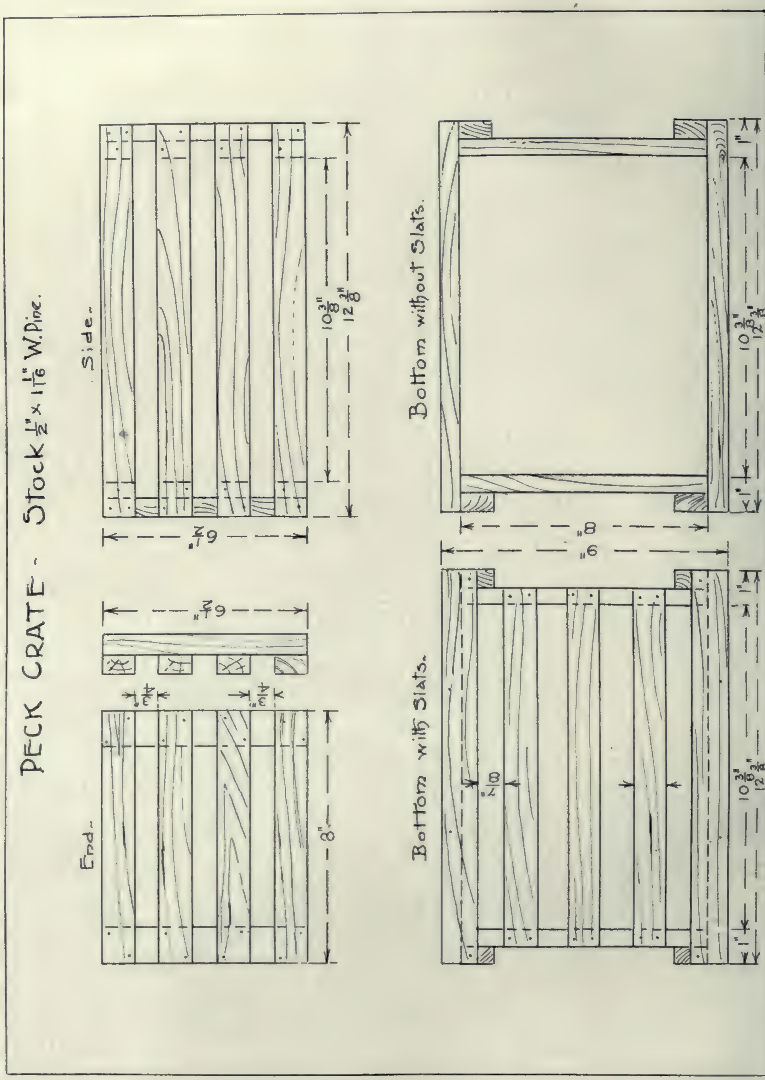

PECK CRATE - Stock 1/2" x 1 1/16" W. Pine.
Side.
End.
Bottom without Slats.
Bottom with Slats.

PLATE II.

In regard to the material it might be said that the school should not be expected to supply more than the instruction, and if the boys want the completed models they should pay for the material. If, however, they do not care to take the models under these conditions, the director may sell them to other pupils or to outsiders.

The cost of the entire equipment for the work should not be more than twelve dollars for each school, which is less than is paid for many of the charts and maps purchased for rural schools. The expense of maintenance is estimated as follows: The salary of the director should be twelve hundred dollars a year, and he should be able to pay traveling expenses, supply typewritten instructions and so manage the material problem that the added expense would not exceed $300 per year. This would be an increase of sixty dollars in the annual expense of the school, but it would be an investment in progressive education that would yield big returns in the better development of the young men of the country. In reality it means that a farmer now paying a tax of ten dollars would be called on to pay but one dollar additional. I am sure that the farmers of this land will not let the crop of boys go neglected for this paltry sum.

In trying out the plan as referred to above, Mr. Cushing arranged to give it a trial in a one-room school located two and one-half miles from the Institute. He conducted the work as if he was the director and this was one of his twenty-five schools. The experiment proved very satisfactory, and it is felt that the plan is thoroly practical as far as each school is concerned. The question yet to be solved is whether it is possible to get twenty-five schools to cooperate in the plan. It might be added that the county superintendent and teacher were very favorably impressed with the work as carried on in this school, and the boys were very enthusiastic over it. All the pieces were paid for by the makers except one, and that was eagerly purchased by a fellow pupil.

Consolidation of schools is an excellent idea to be carried out where possible for improving conditions in rural schools, but the consolidation idea has been in existence for about twenty-five years and still there are many one-room schools and many persons believe there will be for a long time to come. Shall we not try to help these schools in some other way? This plan is an effort along this line. Instead of concentrating the equipment as in the consolidated school it is distributed among the twenty-five schools, and instead of transporting the pupils to the consolidated school the director is transported to the twenty-five schools.

Below is given a copy of the typewritten instructions and drawings for making the first model as worked up and used by Mr. Cushing in the school referred to:

EXERCISE I—THE PECK CRATE (PLATE II).

1. Never use a pencil unless the directions say to use one.

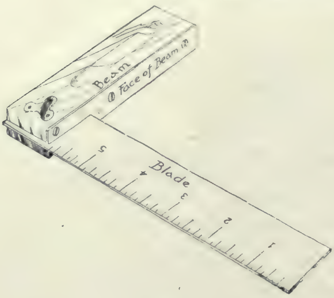


FIG. 1.

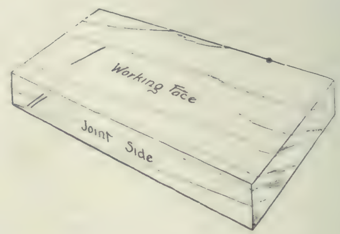


FIG. 2.

2. From Fig. 1 learn the parts of a try-square and be ready to name them when I come again.

3. Before beginning to work on a piece of wood, look it over; select the better face and mark it with a *light pencil line.,* thus /, Fig. 2. This is called the

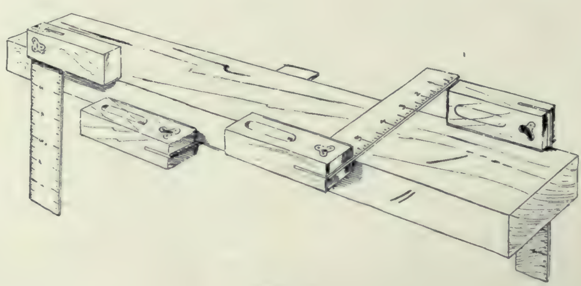


FIG. 3.

working face. In the same way select the better side and mark it with *two light pencil lines,* thus //. This side is called the joint side.

4. Never put a try-square on a piece of wood unless the face of the beam rests against either the working face or the joint side (Fig. 3).

5. Mark the working face and the joint side of one of the long sticks (Fig. 2), as explained in paragraph 3.

SQUARING AROUND.

6. Make a knife-line around the stick, far enough from the end to be on perfect wood, in the following manner: Place the beam of the square against

either the working face or the joint side. Figs. 4 and 5 show how to hold the try-square. Next draw a line with the point of the knife along the blade of the square. Fig. 8 shows how to hold the knife. Place the square on another side so that a line may be drawn which connects with the end of the line drawn. Continue to draw the knife-line entirely around the piece. This is called squaring around. Before placing the square upon the wood, see that the beam comes against one of the sides which you have marked. Fig. 3 shows that the line may be drawn on two faces with the beam against the joint side, and on two sides with the beam against the working face. The lines should meet at the four edges of the stick if you have followed the instructions. If they do not meet, find your mistake and correct it, or move over one-quarter of an inch and square around again.

FIG. 4.

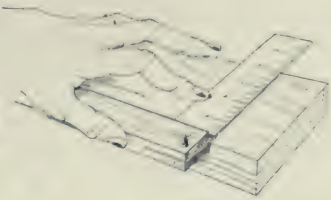


FIG. 5.

SAWING OFF.

7. You are now ready to saw off the end. Notice that saw teeth are on each edge of the saw. Use the finer saw; it is the cross-cut saw. Saw as close to the line as you can without touching it, keeping the saw out in the waste wood (Fig. 9).

MEASURE TO LENGTH.

8. With the rule in the right hand and the try-square in the left hand, slide the try-square along until the edge of the blade is 8″ (the mark ″ means inches) from the end just sawed (Fig. 6). Lay down the rule without moving the square and draw a knife-line across the stick at the edge of the blade of the square. Continue this line around stick as

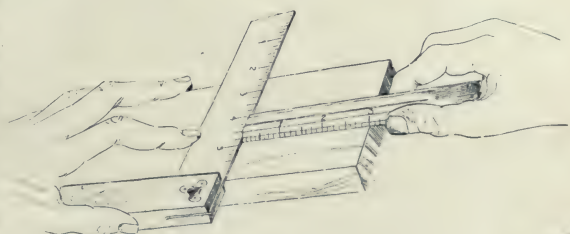


FIG. 6.

FIG. 7.

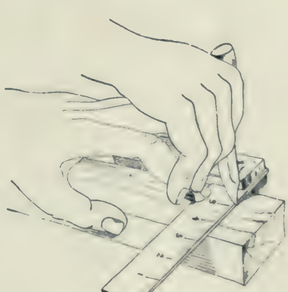


FIG. 8.

explained in paragraph 6. In measuring the longer pieces the knife should be used as in Fig. 7.

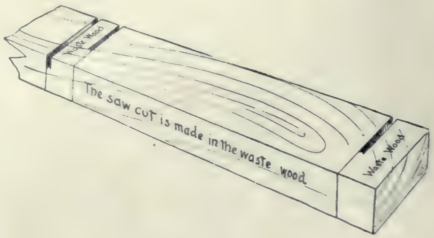


FIG. 9.

9. Saw off at this line (Fig. 9). Which side of the line must you saw in order to leave the piece just 8″ long?

10. In a similar manner saw four pieces 8″ long. Be sure to square around each end. Holding them all in your hand, stand them on ends on some level surface, and see if they are equal in length. If any are not of the correct length, lay them aside and make others. If your pieces are not of the correct length, will your crate hold just a peck? Will you be proud of your work?

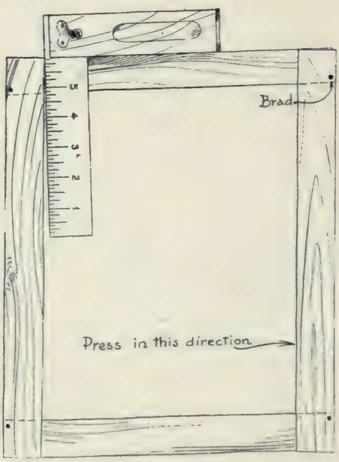


FIG. 10.

11. Next saw two pieces 6½″. Use the pieces which you have spoiled, if there are any. Remember to square around every time before you saw.

12. You have now sawed all the pieces for one end of the crate; see the end view in the drawing of the crate. Lay the two 6½″ pieces flatwise on the table and parallel. Select two of the 8″ pieces which are *exactly* of a length and nail them, as illustrated in Fig. 10, with *one brad in each end of each piece.* Take care to make the pieces "flush" or even at the ends. From the drawings, see where to put the brads. Now square the frame as shown in Fig. 10, and drive in the other brads. Test again with the square. Nail on the other pieces, getting the location from the drawings. Take care that the hammer does not mar the wood.

13. Saw, as explained before, ten pieces 12⅝″ long. Take your time and be accurate. Test for length as explained in paragraph 10. If any are not of the correct length, lay them aside and saw others.

14. Saw three pieces 11⅜″ long, using the pieces which you have just spoiled, if possible.

15. Saw pieces for the other end and nail them together as explained in paragraphs 5, 6, 7, 8, 9, 10, 11, and 12.

16. Select four of the 12⅝″ pieces which are exactly of the same length and nail, with one brad in each end of each piece, to the two end pieces as shown in Fig. 11. See that the ends of these slats are just flush with the corners of the end frames. Test with the try-square; straighten, and drive in the other brads. Use the large brads. Nail on the other side slats, getting the location from the drawing.

17. Turn the crate so that the bottom may be nailed on (see the two views on the drawing). Nail on the two outside slats with one brad in each end of each piece. Make them flush with whatever they join. Test with square and straighten; drive in other brads. Nail on other bottom slats, getting location from the drawing.

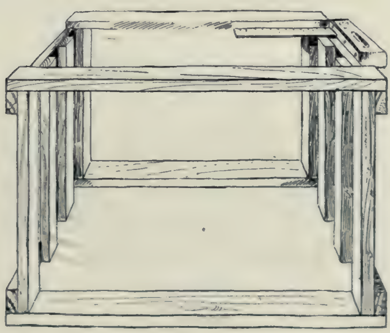


FIG. 11.

THE SECOND YEAR NIGHT SCHOOL CLASS
IN ARCHITECTURAL DRAFTING.

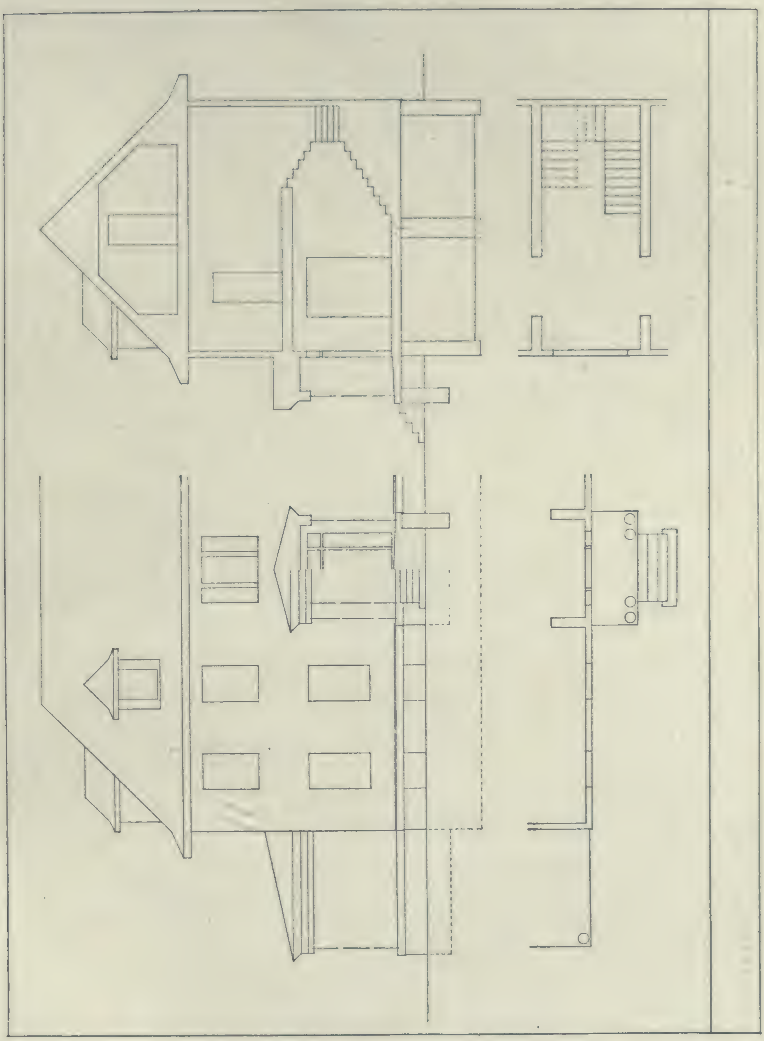
ARCHITECTURAL DRAFTING IN THE MARYLAND INSTITUTE.

II. TRAINING IN FRAME CONSTRUCTION AND DETAILING.[1]

JAMES FREDERICK HOPKINS.

THE first article of this series outlined a four years course in architectural drafting planned upon a basis which would appeal to the artisan. In attempting to describe the spirit of this work we tried to show how it had been made to parallel the needs of the boss carpenter, the expert mill-man, the careful building superintendent, and the broad minded architect in training readers of drawing and draftsmen for useful service in these four related fields.

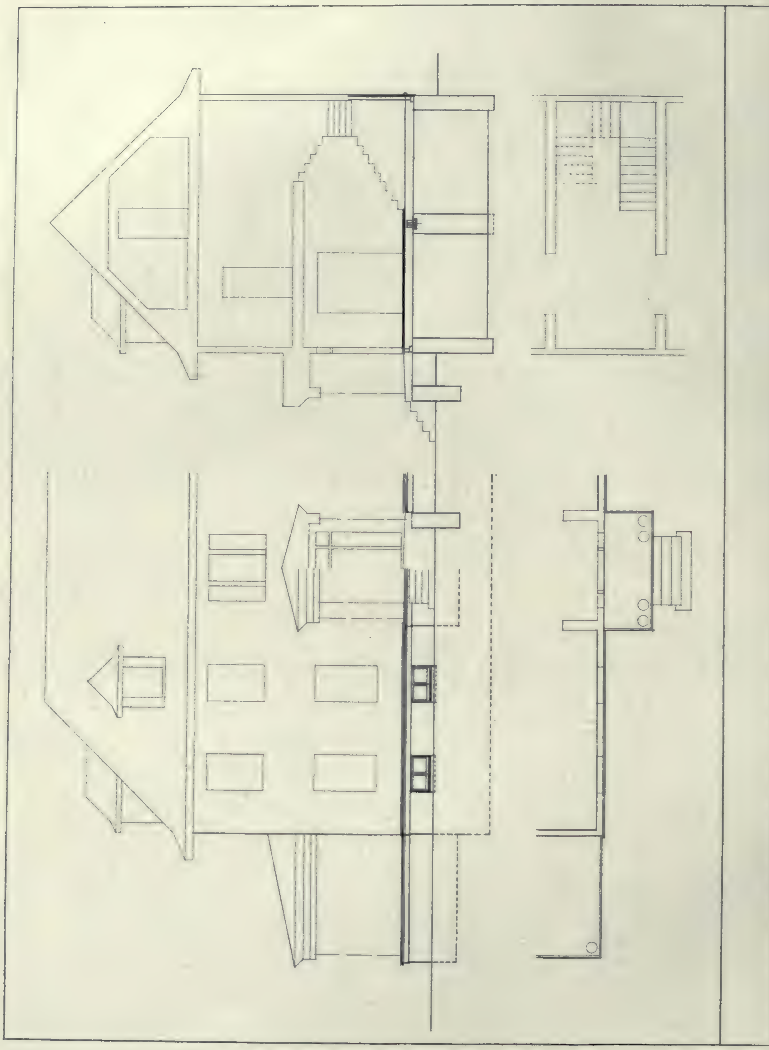
It is the purpose of the present article to describe briefly the work of



THE PENCILED "LAYOUT"

FOR THE STUDY OF FRAMED CONSTRUCTION.

This reproduction, which for the sake of convenience and clearness, was made in ink instead of pencil, shows the character of the "Layout." Certain lines, such as center and checking lines, which were an important and necessary part of the student's lightly penciled drawing have been omitted. The positions and dimensions of the house masses were taken from a blueprint, copies of which were furnished to all students of the class. This blueprint was laid out on ⅛″ scale, while the study of frame construction was to be on ¼″ scale.

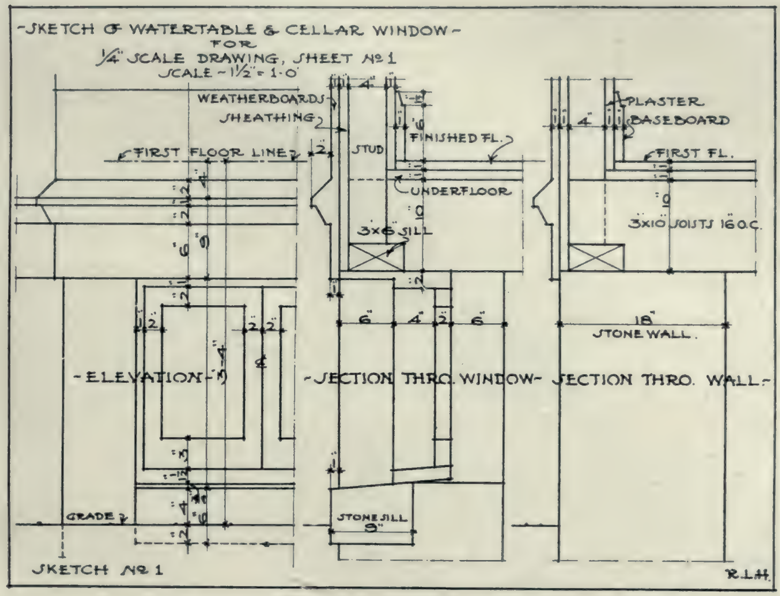


STUDY OF FRAME CONSTRUCTION.

This is a reproduction of the drawing carried into its FIRST STAGE and showing foundations, piers, cellar windows, and water-table completed, and the first floor laid. This drawing should be studied in connection with the sketch and its notes on the opposite page.

the second year, wherein the interest centers on a knowledge of construction, full size detailing, and special problems in the field of frame structures for service with the mill-men or on the buildings.

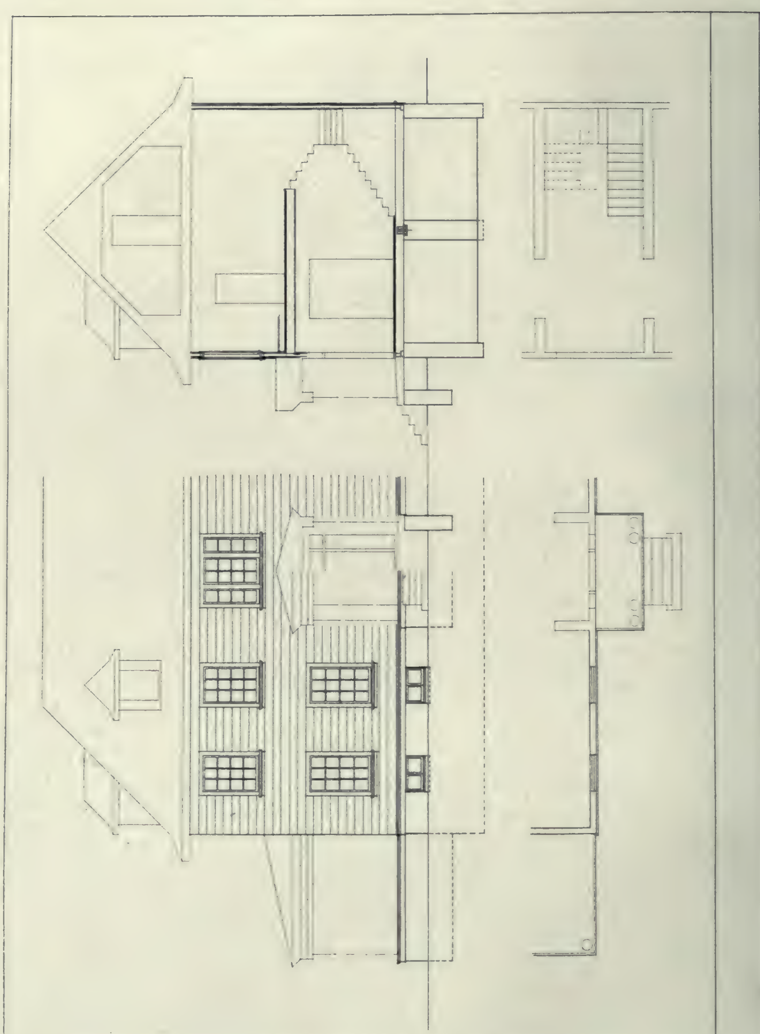
Many teachers who have outlined consistent courses in architectural drafting and who have aimed so to arrange their problems that one years' work would safely rest upon the foundation of the preceding season's study, have found the field of constructive details the most puzzling to



SKETCH OF WATER-TABLE AND CELLAR WINDOW.

This sketch was drawn on the blackboard of the schoolroom after the manner of the illustration on page 338. It was sketched freehand by the students as freely as in the sketch on page 339. Drawn to scale in the note-books with the same thoughtful care as the scale drawing on page 339 it served as thoroly understood material for furthering the drawing on the opposite page.

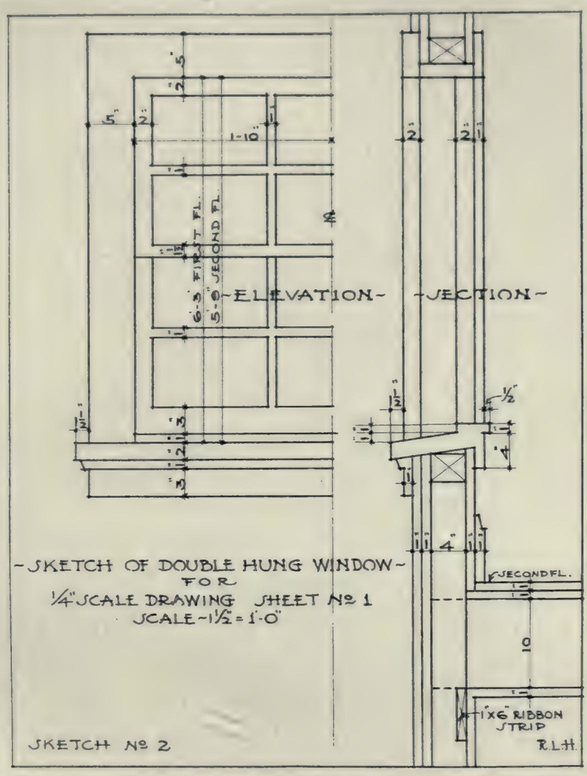
present properly. Some have endeavored to train in knowledge of construction by use of models, either made full size, or on reduced scale. In many instances lectures and the use of note-books have aided in this important undertaking. Other instructors have trained their students by developing sheets from charts or text-books on constructive details. Still others have endeavored to reach their goal by the use of carefully planned projects which when multiplied in blueprints have furnished the material for faithful work in many interested classes. While all such equipment and methods are vital and necessary for obtaining the best



STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its SECOND STAGE, and showing the completed side walls with first and second story windows, and the second floor laid. The reader will notice the marks of progress in this stage in elevation and section as well as plan.

results, yet it should always be remembered that the accomplishing of a certain number of drawings in a winter's course is not the only goal to be attained. Unless the models, lectures, note and text-books, and sheets developed are utilized upon a basis which appeals to the artisan, parallels

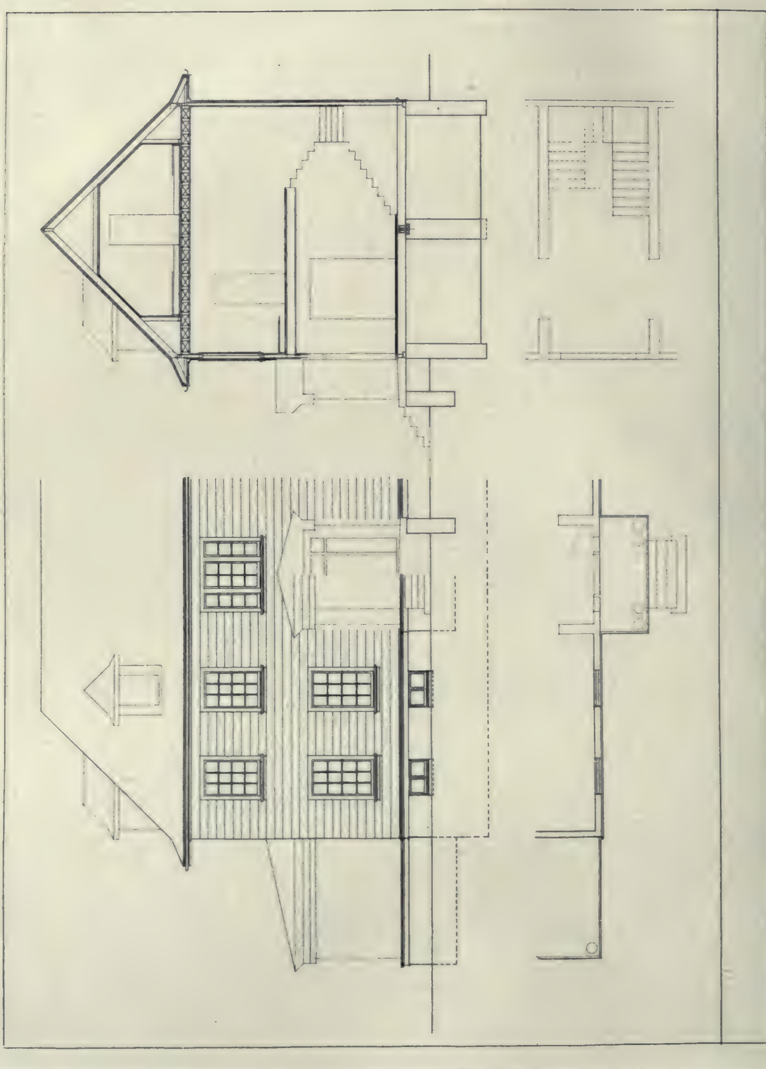


SKETCH OF SECOND STORY WINDOW.

This sketch after being explained from the blackboard and from the window model, sketched freehand and drawn to scale, was the inspiration for the work shown opposite. The reader will recognize that these sketches only show the lines necessary for proper technique of ¼" scale drawings.

his natural train of thought gained on many a building's growth, and harmonizes with the best of office practice and procedure, the effort fails of its most practical accomplishment.

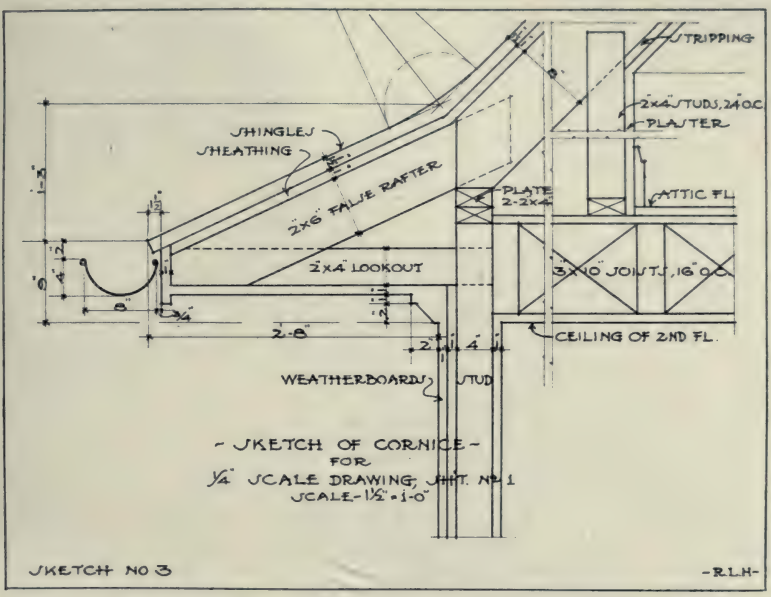
Primarily then, the course should grow as a building grows and the sheet technique be consistent with the scale chosen for the drawings. Thus will the artisan's point of view be happily met and the demands of the best office practice be satisfied.



STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its THIRD STAGE, and showing the cornice, roof, and attic floor completed. In this stage the greatest progress naturally shows in the section.

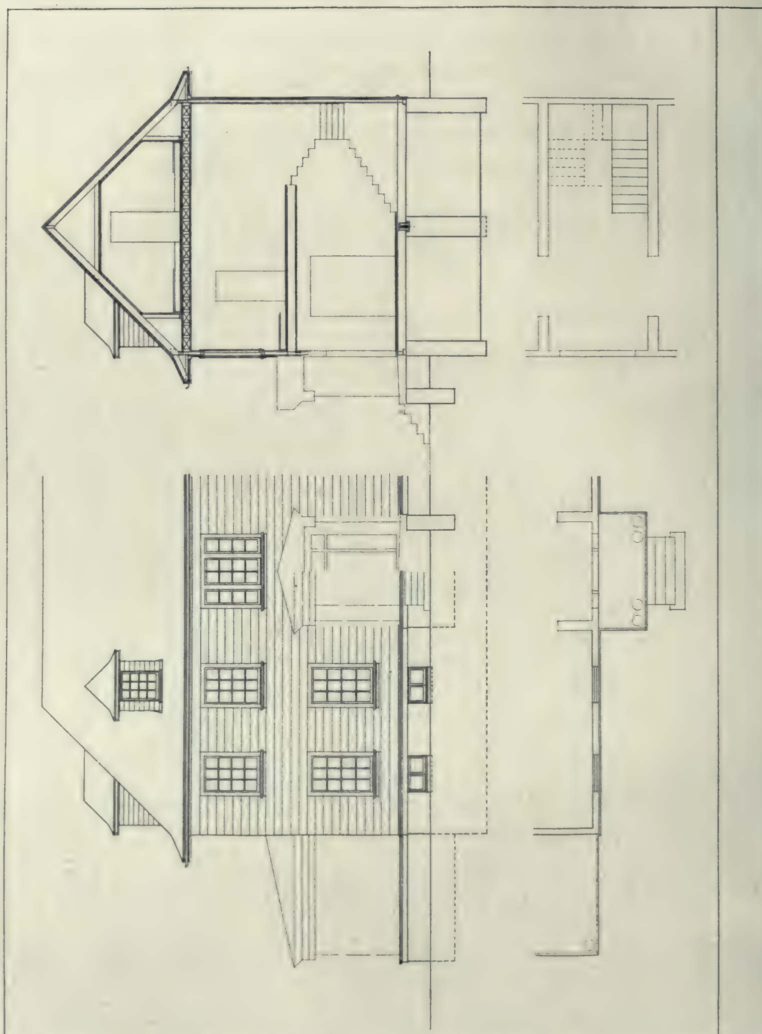
Every teacher of architectural details will testify to the difficulties he has experienced in maintaining clear ideas of relationship between the portions of construction on which he has concentrated the interest of his classes. As every building is an aggregation of related units, as for instance, foundation material, lumber, fastenings, bricks, plastering, doors, sashes, etc., so the winter's study of details should be a clearly thought out, thoroly understood, and broadly studied project of unified elements rather than a scattering course of unrelated details.



SKETCH OF CORNICE, ROOF, AND THIRD FLOOR CONSTRUCTION.

These graphic notes, after thoro study in explanation, sketch, and scale drawing, gave the power to intelligently raise the rafters, fashion the cornice, bridge the third floor, and set studs and the tie beams which also carry the attic ceiling.

The training of the first year course in the Institute offered the very best preparation for the problems we are describing. The boys who had entered the previous year, full of the thirst for knowledge of how to read blueprints and to understand the working-drawings of building construction, had been carried to the point where they were safely grounded in the ability to block out, in elementary fashion, the plans, elevations, and sections of a not too complicated structure. Training in elementary mathematics and the review of practical arithmetic as

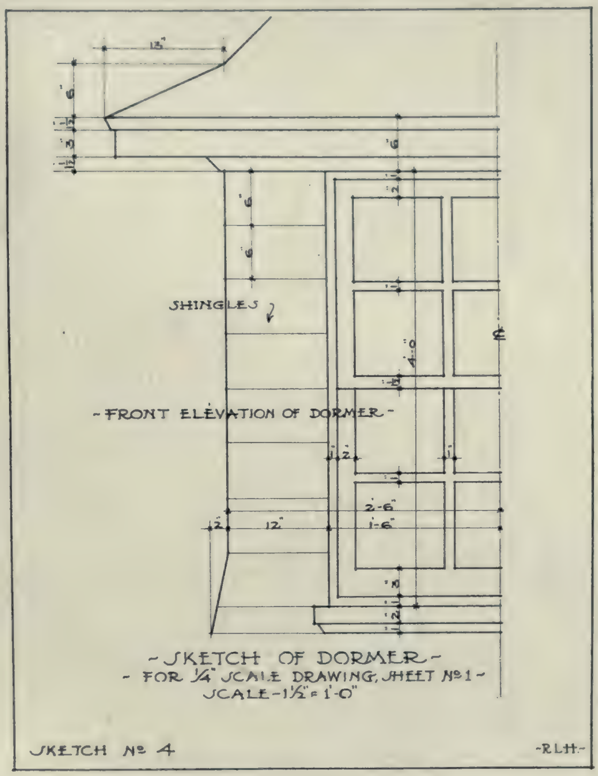


STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into the FOURTH STAGE and showing the completion of the dormers and their windows.

applied in building problems had, in addition, brought them to the point where they were ready intelligently to combine the materials of frame construction.

The limits of this second year field, and the necessity of developing power which should lead up to a third year course were just as clearly

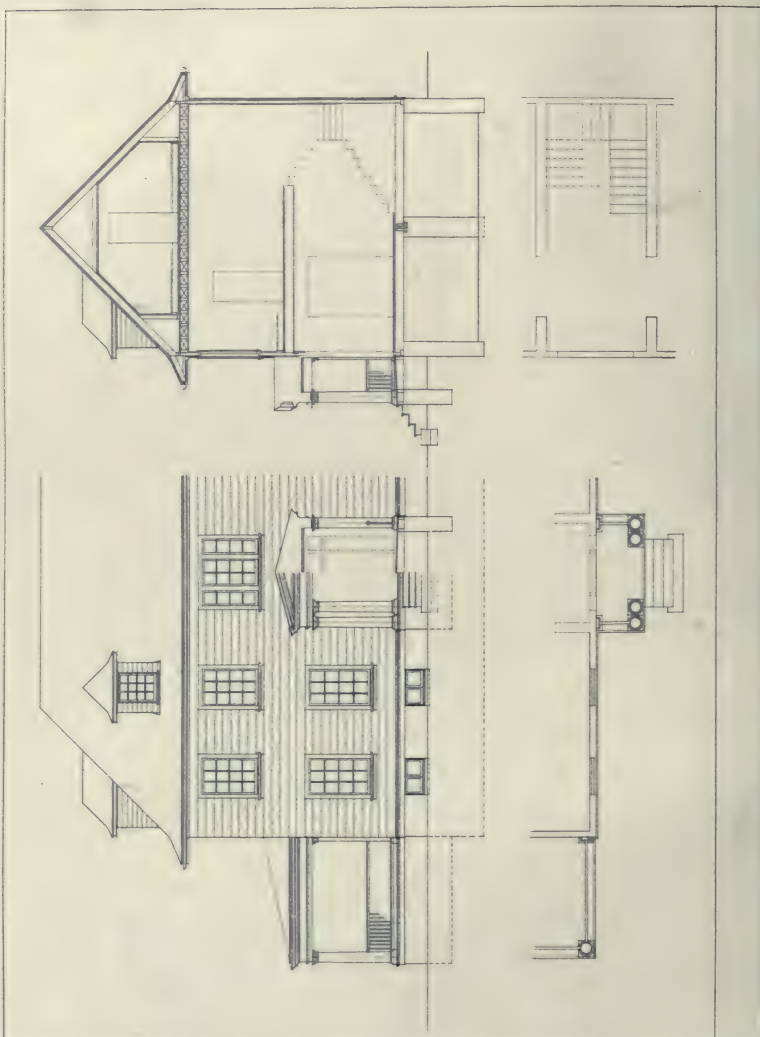


SKETCH OF THE DORMER AND ITS DOUBLE-HUNG WINDOWS.

This sketch, when thoroly understood, provides material for an intelligent completion of the roof elevation and section. Filed away in a scale drawing, it becomes an important part of the year's note-book, serving, like the other sketches, for suggestive treatment of ¼″ scale drawings.

fixed. Frame construction was to be the watch word of the year, frame construction developed from the artisan's point of view, studied in related details, and treated in the technique of consistent office practice in ¼″ scale, ¾″ scale, and full size detail drawing.

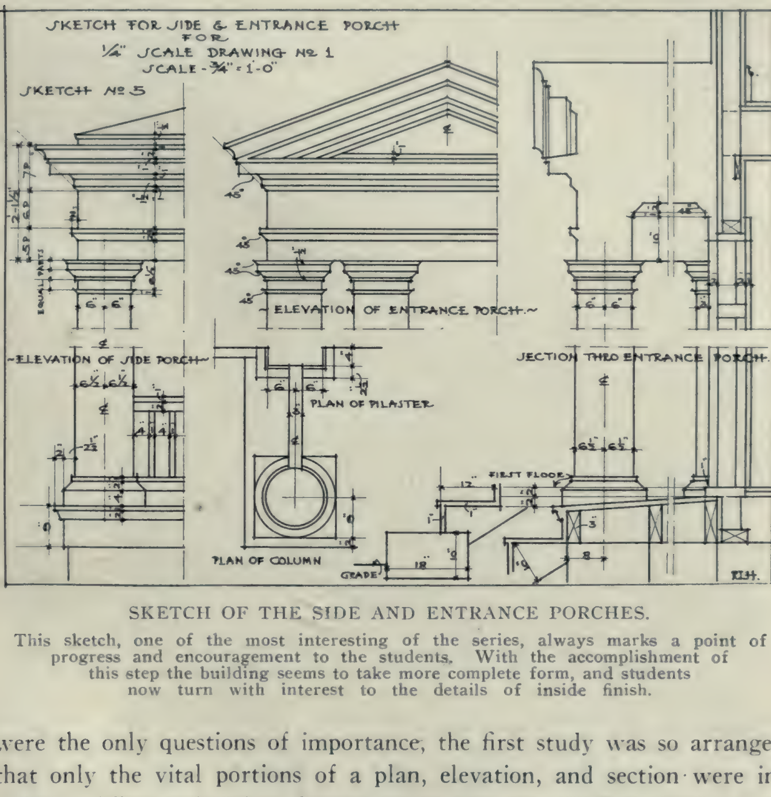
When the changes which led to the present status of the second year work were first discussed it seemed as if the only solution of the problem



STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its FIFTH STAGE and showing the completion in elevation, section, and plan of the front and side porches.

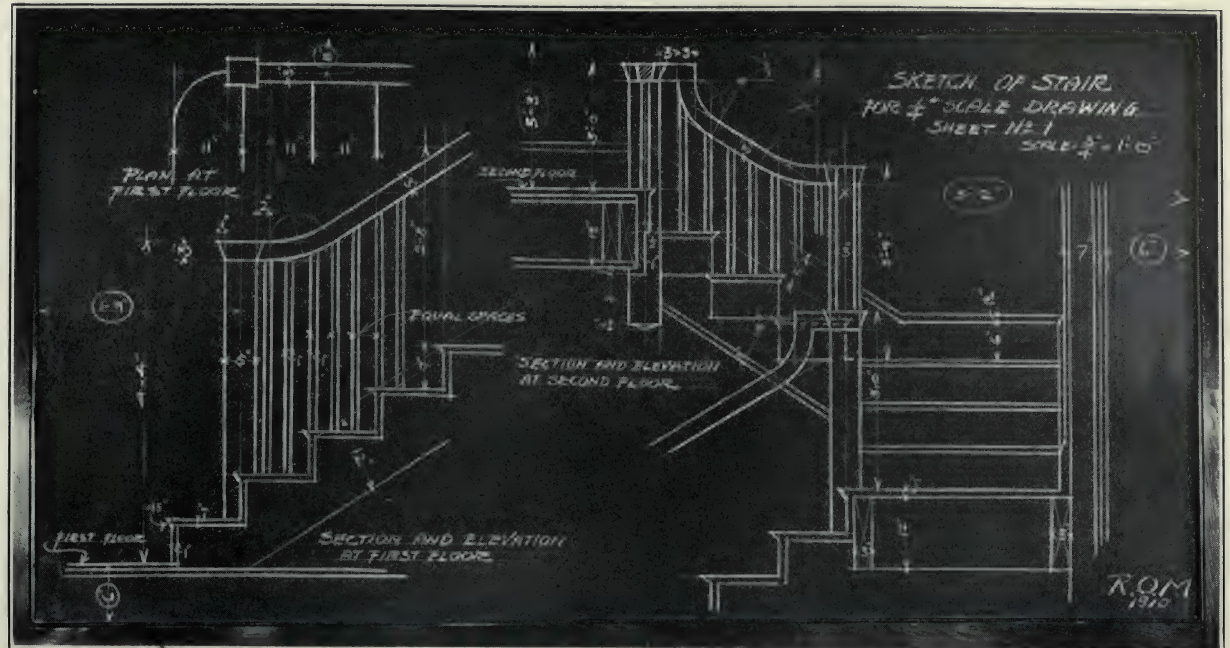
lay along somewhat untried lines if the desired detail study was to be maintained in a thoroly related unit. The proper study of a frame building involves plans, elevations, and sections, if all elements of the construction are to be clearly studied and understood. To draw complete plans and the four elevations of the house seemed impossible in the time allowed, yet it seemed necessary to keep the student's state of mind in the constructive field. Realizing that construction and details



SKETCH OF THE SIDE AND ENTRANCE PORCHES.

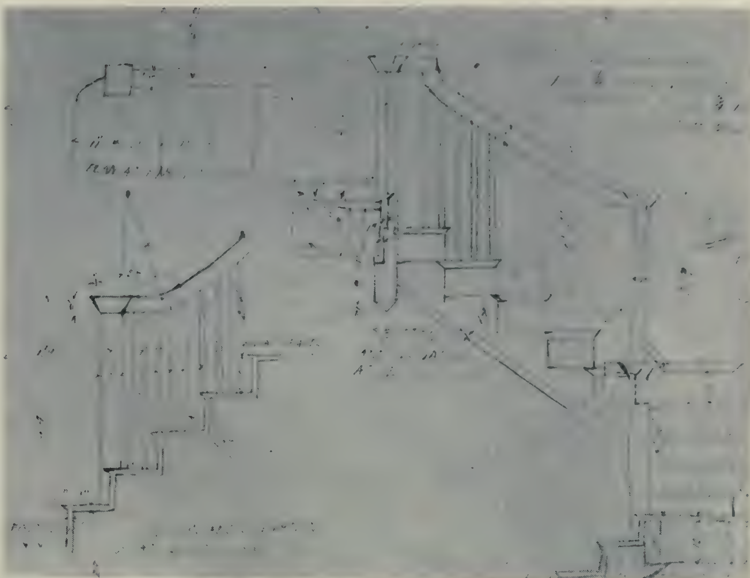
This sketch, one of the most interesting of the series, always marks a point of progress and encouragement to the students. With the accomplishment of this step the building seems to take more complete form, and students now turn with interest to the details of inside finish.

were the only questions of importance, the first study was so arranged that only the vital portions of a plan, elevation, and section were included. Thus reduced to lowest terms and the problem lightened of all unnecessary effort, the work proceeded as shown in the series of progressive illustrations here presented. These reproductions have been taken from one of the very drawings as the work progressed. Back and forth from the class room to the engraver's establishment has traveled the drawing-board and there has resulted a series of progressive studies on which, as on a moving picture film, the reader may see the progress



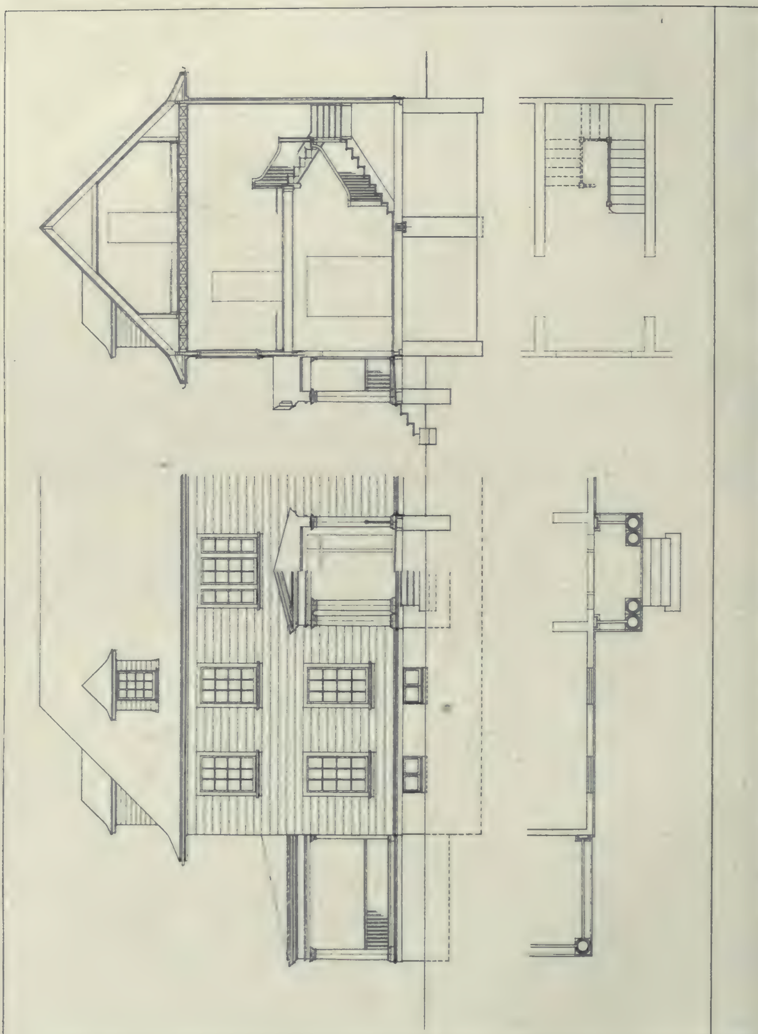
A PHOTOGRAPH OF THE CLASSROOM BLACKBOARD SHOWING SKETCH OF STAIR BUILDING DETAILS.

This photograph of the classroom blackboard will make clear better than pages of written description, how the different sketches illustrated, have been presented to the pupils. The instructor draws the sketches on a large scale in the technique of the ¼″ scale details. He calls the class about him and explains the sketch with model in hand. From this blackboard drawing the students make their freehand sketches. See picture of the classroom on page 326.



FREEHAND SKETCH MADE FROM THE BLACKBOARD BY AN ARTISAN STUDENT.

SCALE DRAWING MADE FOR THE NOTE-BOOK FROM THE ABOVE FREEHAND SKETCH.

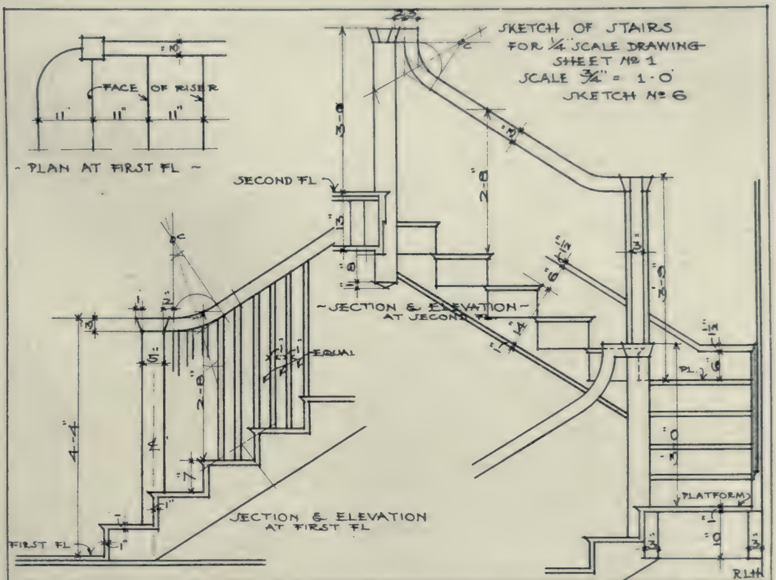


STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its SIXTH STAGE and showing the completion of the stairway in the section and stairway plan.

of the work. Indeed it is a story that hardly relies upon words for its telling.

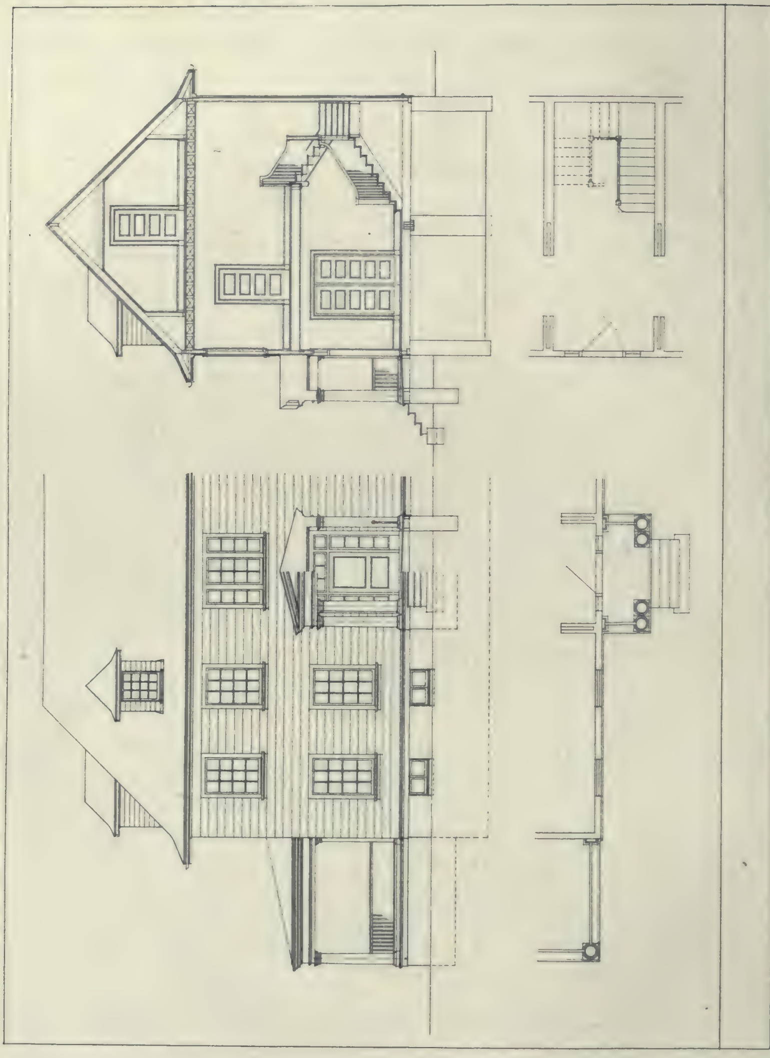
The illustrations shown on pages 338 and 339 representing the class-room blackboard with its sketch of stair building details, the freehand notes made from this board by an artisan student, and his sketch drawn instrumentally to scale, should be of much interest to the reader seeking insight into the methods under which this work was conducted.



SKETCH OF STAIRS.

This sketch which should be studied in connection with the blackboard, the freehand sketch and the scale drawing illustrated on pages 338 and 339 marks an important step in the inside finish. The reader will recognize that while almost every important element of stair building in the average country house is here introduced, that it is treated solely as a sketch drawn to scale. This only emphasizes the fact that all these sketches should be read as notes and not with the strict interpretation of what an architect calls a "detail drawing."

This same expert reader will undoubtedly recognize a discrepancy between the drawing on the blackboard and the note-book sketch, and this, while brought about by the limiting dimensions of the blackboard, was intentional upon the part of the instructor. This trap for the unwary student, consisting of a different number of steps in the stairway shown on the blackboard from a number called for by the "Layout," was properly explained by the teacher. It will be seen that the student has responded to that warning in the making of the sketch, and has so

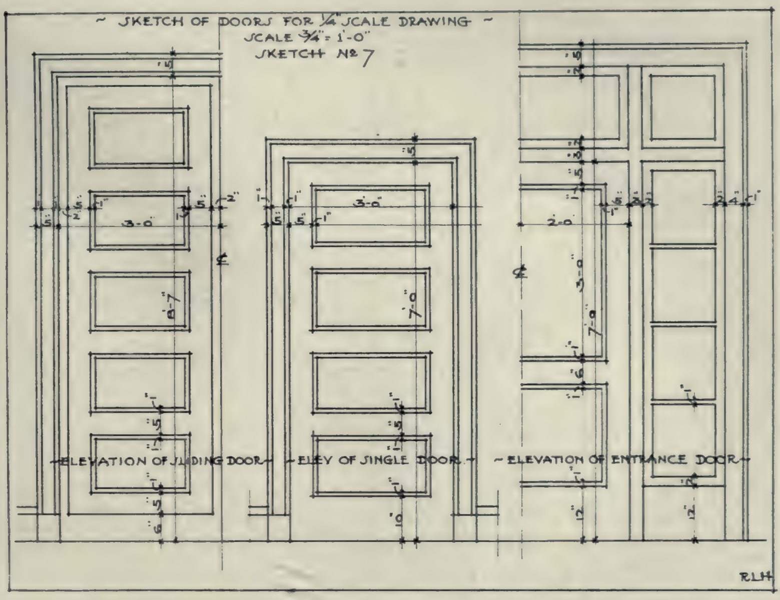


STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its SEVENTH STAGE and showing the completion of the trim and the hanging of the doors in elevation, section, and plans.

amplified the number of his steps that they coincide accurately with the house in question. Thus are those who would blindly copy spurred to keener thought and accurate personal endeavor.

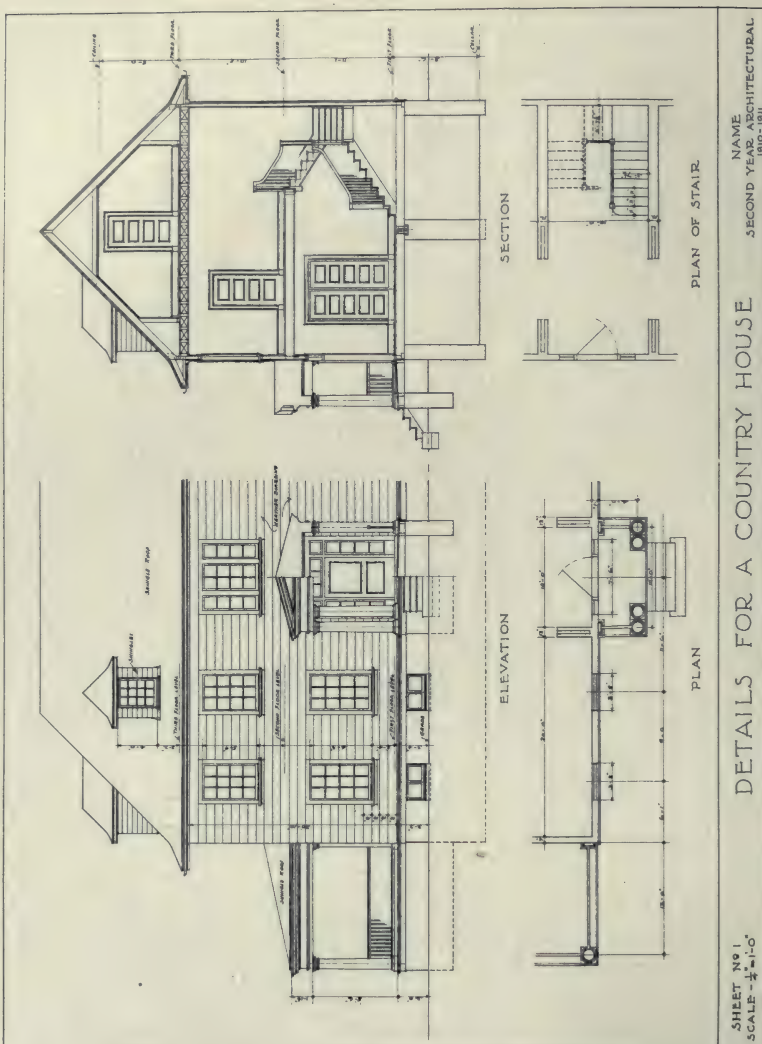
The rough freehand sketch and the instrumental note-book sheet illustrated, were taken at random from among the students of the class and illustrate very fairly the technique which the course is developing. It may add to the reader's appreciation to learn that the man who made these drawings is a carpenter, working daily on heavy outdoor con-



SKETCH OF DOORS.

These sketches of the front door, the sliding doors in the lower hall, and the single doors in second and third story, play important parts in the seventh stage of the study. With the hanging of the doors the inside finish of the house is accomplished.

struction work. Any school may well be proud of those who, after a day's work in winter weather, come in to its night classes and accomplish such draftsmanlike results. The tale of how this young artisan heard of the Institute, how he hoped to advance himself in his trade by night study, how he has worked thru the industrial grades from boy to helper and on to skilled workman is an interesting one which can not be told at this time. We can only record his enthusiastic statement concerning the Institute's part in his career and offer it in his own words, "Say, if I can only keep on at this I'll be a boss some day myself."



STUDY OF FRAME CONSTRUCTION.

A reproduction of the classroom work carried into its EIGHTH STAGE and showing the closing of the study in workmanlike fashion, by the addition of dimensions, explanatory notes, and the simple lettering without which no drawing is complete. The student who has carried forward this study has seen his sheet grow as a building grows and has kept his technique thoroly consistent with the scale chosen for the drawing.

Teachers of experience who may read this article and its description of an effort which has long since passed the experimental stage may question concerning the amount of time put upon this study and whether the interest of the students lagged at any point in its progress.

Many teachers very properly advocate developing the individual class exercises in such a manner that fresh problems will frequently appear and thus counteract the spirit of fatigue which otherwise may creep in. This, however, is a situation more in keeping with first year work than it is with the state of mind of the more seasoned students of this second year. Training which shall develop the power of sustained effort can not at some time be amiss in any educational scheme, and the interest with which this probem has grown as each link added itself to the lengthening chain has carried with it a growing power for independent effort most refreshing to contemplate.

The amount of absence in any night school class is the indicator by which the successful teacher tests the pressure of student interest in the work. This study of frame construction started in early October and ran thru to about two weeks before Christmas. Aside from the empty places due to absence from the city and the necessity of working over time upon the part of some of the artisan students, the attendance showed a record most remarkable and encouraging, and at the close of the study practically all work was handed in.

With the completion of this ¼″ scale drawing of the different elevations, coupled with the scaled note-book sketches rendered instrumentally, there had developed a consistent knowledge of related frame construction and the way it should be rendered at this scale in an architect's office, which we do not believe could be so easily, so entertainingly and so soundly taught in any series of sheets not as closely related. The story of how this knowledge was carried into ¾″ scale studies and then into the full size drawings for the mill and the building, is still a tale of the second year work, but is an article in itself and must await another opportunity for its telling.

VOCATIONAL TRAINING FOR BOYS IN LEEDS.

JOHN F. REIGART.

LEEDS is the fifth city in England and has a population of about 450,000. Its industries are diversified, including the manufacture of woolen and linen goods, iron-founding and machine-making. In the range and efficiency of its municipal activities Leeds occupies an advanced position. The educational facilities are exceptionally complete, from the schools for defectives and delinquents, to university, technical, artistic, musical and professional education. The announcement, in outline, of the technical evening schools alone requires a pamphlet of 470 pages. School attendance is compulsory from the age of five to fourteen. The completeness of the scheme of manual training will be recalled by readers of Professor Bennett's articles on "Manual Training Schools in Europe."[1] My primary object in visiting Leeds was to study that feature of vocational training in which this is the pioneer city in England, namely, Day Preparatory Trade Schools.

THE PROBLEM OF THE INTERMEDIATE INDUSTRIAL SCHOOL.

Of all the problems of industrial education which demand solution in this country, the most difficult is perhaps the one of the intermediate industrial school. Such a school must be practical, yet it must not teach any trade; it must have adequate facilities, yet the expense must not be prohibitive of its extension to all who are likely to enter upon the trades with only an elementary education; it must be adapted to children who are incapable of higher technical occupations, yet it must not take a form of class distinction so as to violate the popular conceptions of democracy. The age of entrance must be low enough to secure a year or two of instruction for those who leave as soon as the law allows, yet not so low as to cause premature selection of occupation, or to lower the age of entrance into trades. The course of study, to have value, must be adapted to local conditions, yet it must not expand the labor supply in the local industries. The aim must be to cultivate skill (in an indefinite sense), combined with industrial intelligence (also not defined).

[1] See April, 1910, number, pp. 360-365.

Only a partial solution of the problem has been attempted in the intermediate vocational schools established in various parts of this country, as reported in the Descriptive List of Trade Schools, published by the National Society for the Promotion of Industrial Education. All these schools limit their opportunities to selected groups of children. The aim seems to be to make a record for turning out efficient workers, rather than to render more useful the children whose intellectual endowment dooms them to the ranks of the unskilled so long as the way to all forms of vocational training is barred by sixth, seventh or eighth grade standards. An entrance age of fourteen further limits opportunities to those who are not forced by poverty or other circumstances to begin work at the earliest legal age. As an additional aid to making a record for the school, entrance is sometimes conditioned not only upon the grade and age, but upon satisfactory marks in studies and conduct, and the manifestation of an aptitude in the use of tools. A further check upon the limitation of the vast numbers of children entering upon unskilled, or semi-skilled forms of labor, is the great expense attached to our present schools. Most of the schools in the list already referred to are conducted at a per capita expense greatly in excess of that for high schools. It is safe to predict that communities will be slow in the extension of such expensive schools.

THE ENGLISH POINT OF VIEW.

I turn to the entrance requirement of the Holbeck Day Preparatory Trade School of Leeds: "Any boy who has attended an elementary school regularly, and who is 13 years of age, is eligible for admission." In this connection it may be suggestive to note the problem of day industrial education as it was formulated by the London Education Committee:

> The Committee think that special day schools of the day industrial school type might, with advantage, be established for the temporary treatment of children who are not up to the normal school standard, and are not yet so defective as to warrant treatment as "mentally deficient."
>
> This different educational treatment would mainly consist of a further development of the concrete method of instruction by means of manual and industrial training, but fewer than the usual number of children would be taught by each teacher. It is of importance to bear in mind that the child who may be carelessly termed a backward child may not be really backward but only not normal in regard to standard of education, inasmuch as the conditions of his life may have been such as to have prevented him from attaining that standard of education which a child in ordinary circumstances would attain, or he may be

simply not normal consequent upon backwardness in acquiring ordinary school knowledge altho possessing a ready ability to acquire instruction of a manual or industrial character. Such children are, of course, not suitable for a special school, but do not fall readily in with the normal curriculum of an ordinary school. It is absolutely necessary that the curriculum in the ordinary graded school should be suited to the requirements and the capacities of the great majority of the children attending it, but we believe the Committee will agree that it is undesirable to set up the same aims and provide the same kind of teaching for the children who have either been from their circumstances retarded in their ordinary education, or who, by their condition, are better suited to acquire knowledge by means of manual or industrial occupations. We are, moreover, of opinion that it would be injurious to the self-respect of children of this kind to segregate them in schools to be known as "backward schools," the more especially as it is not unreasonable to suppose that if they were given the kind of education suited to their condition they would by means of their development in manual and industrial work become the better able to acquire the ordinary academical knowledge of the elementary school. We are advised that among the duller children to be found in some of the poorer districts there is room for a type of education differing very widely from that which has become traditional in the ordinary graded schools—a type which should enable such children to make use of the opportunities for industrial employment after leaving school by allowing them to develop their intelligence thru their fingers in the day school itself. Such a school would not be regarded as a "backward school" but as one in which special attention is paid to industrial training, and it is very probable that for the sake of the practical instruction so given many parents would of their own choice send their children to such schools. We think, therefore, after having given prolonged consideration to the question, that it is desirable for such a type of school to be established, but we are of the opinion that it would be advisable that the fullest information be obtained as to the working of such a school in London, and that it would be well to make an experiment and for the present to confine that experiment to one school. This school should be at Saffron-hill. This experiment, if adopted, should furnish valuable information as to the effect of giving a more practical turn to the instruction in schools situated in industrial neighborhoods where it is reasonable to suppose that the majority of the children would, if not given an early opportunity of receiving some industrial training, probably drift into the ranks of the unemployed and, too frequently, unemployable class.

Evidently the English point of view, at least that of London and Leeds, is different from the American. The one is that of the welfare of the child, the other is that of the employer. Our plan, as thus far formulated, is not calculated to diminish the available supply of ignorant, unskilled labor, but to shorten the period of unprofitable learning in the factories in the case of those who are intelligent enough to be destined for the higher forms of labor.

THE LEEDS DAY PREPARATORY TRADE SCHOOL.

The Leeds plan was initiated about four years ago, and has been adopted by other towns in England. Its distinctive features are:

(1) Liberal entrance conditions as to age and attainments.

(2) An intensive use of a very moderate equipment.

(3) The use of the same equipment for day and evenings schools.

(4) Individual instruction, providing for the inevitable irregularity of entrance and of leaving for work and for the successive use of the limited number of machines.

(5) An intimate correlation of studies.

(6) The supplementing of instruction by visits to the manufacturing works.

(7) A correlation with evening technical schools, including preparation for the third year of the engineering course.

In 1908, ninety boys were under instruction in Leeds. The opportunities of these schools as well as the other means of securing a technical education are suggested to the elementary pupils thruout the city by the following directions printed on the backs of the blank books supplied to the schools:

THE ROAD TO SUCCESS.

You will soon be leaving the elementary day school, when perhaps you may be inclined to think that your education is finished. This should not be so, however, if you wish to be successful in your future career. You have made a good beginning in the day school, but it is most necessary that you still further continue your studies, in order to enable you better to earn your own living, to add to your interest and pleasure in life, and to fit you to take your part as a useful member of the community. There are now plenty of opportunities in the city of Leeds for bright scholars to continue their education beyond the elementary schools.

The best way is to endeaver to gain one of the numerous scholarships offered for competition yearly by the Education Committee. Among the scholarships offered, the following may be mentioned:

(1) Junior City Scholarships, which are provided to take promising boys and girls from the elementary to the secondary day schools of the city.

(2) Junior Art Scholarships, to take promising boys and girls, who show a decided taste for drawing and art work, to the Leeds School of Art for day work.

(3) Junior Domestic Scholarships, to take promising girls to a junior course of practical training in domestic subjects.

(4) Junior Technological Scholarships, to be competed for by boys and girls of 14 years of age who are already in attendance at day preparatory trade schools.

If you are successful in gaining a junior city scholarship you will be able to continue your education at a secondary day school, which will extend your knowledge and widen your ideas and so better equip you for your future career. The

scholarships, with certain conditions, are open to all boys and girls attending the elementary schools of the city. If your parents are unable to allow you to continue your studies at a secondary school, it will be well for you to continue your education at one of the day preparatory trade schools which have been recently opened, or one of the technical evening schools of the city. It should be remembered that the better the education you have received the better will be your chance of being successful in life.

THE COURSE OF STUDY.

For my visit I selected the Holbeck Day Preparatory School, at Holbeck Mechanics' Institute. The boys in attendance appeared to be on a par with the boys in our special classes, that is, those who could not complete an elementary school course. Yet the interest in their studies and the accuracy shown in their work and note-books seemed decidedly superior to what could be expected of this class of boys. I accounted for this by the absence of merely formal work; every lesson seemed to have an intrinsic value. On the day of my visit the composition lesson was on the process of making Bessemer steel. I doubt if any boy thought he was being taught writing, composition and spelling.

FIG. 1. HOLBECK MECHANICS' INSTITUTE.

The mathematical studies are closely associated with problems in mechanics and construction. The determination of areas and volumes by numerical and graphic solutions, English and metric units of measurement, simple algebraic principles and formulas, and percentage constitute the leading topics. These are taught, not as arithmetic, algebra and geometry, but as topics in pracitcal mathematics. Tho no text-book is closely followed, the book most favored by the head master is Consterdine and Barnes' Rudiments of Practical Arithmetic, published by John Murray, London, 1905.

To my mind the most significant work in the school is that of the laboratory for mechanics. The observer of methods in technical instruction in England is struck by the large part played by experimental work.

FIG. 2. MECHANICAL LABORATORY, HOLBECK'S MECHANICS' INSTITUTE.

FIG. 3. PART OF WOOD-TURNING SHOP, WOODHOUSE MECHANICS' INSTITUTE.

In evening schools as well as in the great technological institutions, the laboratories are well equipped and are crowded with students, while the shop equipment is meager as compared with our schools of a similar class. In training, experimentation is held superior to production, thought to skill. There is a reason for this if the object be to develop "industrial intelligence." The rule holds good even in schools of so low a grade as these vocational schools for backward boys. In the Holbeck school the laboratory is proportionately better equipped than the shops, Fig. 2. The note-books of pupils are evidence of painstaking work on the mechanical forces, volume and density, elasticity, friction, etc. However, it seemed to me that many of the boys are swamped by the more difficult problems and are incapable of any great degree of intelligent initiative. Yet even the weaker boys may gain much by this method of getting at the meaning of things—in lieu of knowledge, mere acquaintance is of value.

The English, mathematics, and laboratory mechanics are taught by the head master, who is assisted in the more strictly manual work of the shops by skilled artisans. The head master is thoroly acquainted with each boy and is able to direct him in respect to both his studies and his employment.

INDIVIDUAL INSTRUCTION.

As the organization of studies is from the standpoint of the laboratory, so likewise do laboratory methods prevail in all the instruction. Under specific directions, a boy works at an experiment or a mathematical problem or a drawing or a construction; and when he has finished that piece of work he proceeds to the next. There is no time wasted in waiting for other boys to catch up, and each has an opportunity to develop his own resources. This individual instruction serves both to economize in equipment and to attain the ends for which the course is planned: "improving the general education, developing common sense and reasoning power, and enabling a boy to acquire the necessary manual dexterity to ensure that, he shall be put at once on useful work when he enters the shops."

SUGGESTIVENESS OF THE LEEDS EXPERIMENT.

The Leeds plan of the day preparatory trade school, tho not a final solution of the problem of industrial education, offers many suggestions in regard to that portion of the field which has not yet received adequate recognition in the plans under way in this country—that is, in the case

FIG. 4. METALWORK SHOP, WOODHOUSE MECHANICS' INSTITUTE.

of pupils who are unable to make normal progress in the grades of the elementary school. First, every effort is made to draft all the more capable boys into the secondary schools and into special schools of arts and crafts. Then, there are provided the vocational schools with low standards of admission and with courses adapted to moderate capacity.

We may sum up the points worthy of consideration:

1. A preparatory industrial training should be within the reach of any child capable of becoming an independent, self-supporting workman.

2. The type of school should be determined by the industries of the locality.

3. In large cities there should be many schools of various types, rather than a few large schools. These schools should be near the industrial establishments and in touch with them, and within walking distance of the homes of the pupils.

4. The schools should be small, with a principal who is a teacher, and who can be in touch with the pupils in school and after they have left to go to work.

5. To render extension possible, the management must be economical and the equipment moderate. The test of efficiency should be, not in the completeness of equipment, but in the elevation of the industrial and economic level of the community.

6. The laboratory should rank on an equality with the shop; experimental processes, with methods of instruction; intelligence with skill.

7. Academic studies should be taught in direct connection with the problems of the laboratory and the shop.

8. To meet the difficult conditions in schools of this type, to provide for the varying standards of admission and for awakening interest, and to meet the capacity of both quick and slow boys, the class system should be replaced by individual methods of instruction.

BOOKBINDING IN THE SCHOOL.

George William Eggers.

Oscar Lincoln McMurry.

V. INFLUENCES AND INSTRUMENTS OF DESIGN.[16]

WHAT is the logical order of events in making a design for a book? The watchword of the modern world is, "Be practical." The supreme test today is the test of service. "What is it good for?" "What can it do?" "Will it work?" These are the all-important questions. Even wealth has ceased to justify leisure. Kings and kaisers set their sons to learning trades. Charity has given place to philanthropy. Philosophy is offering us pragmatism. Beauty exists only where it enriches our daily lives. The day of bric-a-brac has past. Up from the background of the fine arts has been hammered the arts and crafts. Every one of these movements is a recognition of this supreme requisite of service in all things.

FITNESS.

What has this to do with bookbinding in the school? Simply this: It answers our opening question. Service or *fitness for service* must constitute the prime influence which determines the character of our design, whatever we may be planning to make, and however our individual temperament may tend to shape it.

For example, some one says, "Make a book." We immediately ask, "What kind of book?" "How large?" "What shape?" "What color?" "What materials?" "What form of construction?" and numberless other questions. The original speaker may undertake to answer each of our questions in detail and so lead us along step by step. He may, on the other hand, answer us by telling us what the book is *for*—by restating the problem *in terms of service,* as: "Make a book for a small number of poetical quotations about native trees, to be used as a desk reference book." In this case we can deduce the answer to all of our questions for ourselves—especially if we have experienced the need of such a book as

we have been told to make. In this case we ourselves answer as well as ask the questions and we do it from our own experience, our guide being the purpose which the book is to serve.

This process of asking and answering for ourselves such questions as will make our book adequate and fine is the process of designing. The answers to these questions expressed graphically on a piece of paper constitute our design. The one who most vitally and subtly questions and who most completely and finely answers himself in the course of the problem,—he is the truest designer.

The questions and answers which relate to the more mechanical and obvious needs may be somewhat crudely classified as the constructive element in the process of designing. The questions and answers which have to do with the more subtle and delicately sensed aspects of the problem—questions whose answers must be more or less personal with the individual maker—may be called the art element of the problem. Just what the point is at which these two come together is a somewhat debatable question, and fortunately an unimportant one.

In all this questioning and answering, in all this making of choices, the consideration of service, of fitness to purpose, is the prime influence. But it is more than a first influence; it is a *constant* influence. From the beginning to the end of the process we must not for one instant allow any other idea seriously to outweigh the idea of having our book serve its peculiar purpose perfectly—peculiarly.

CONGRUITY.

Now any object in which every element has been fashioned under the influence of one constant idea has character, consistency, congruity. The stateroom of a ship has a different character from the stateroom of a Pullman car. Every line in the ship is a response to the unstable quality of water and wind; every line in the Pullman car recognizes the level and solid track and the forward and backward strain. Neither of these was designed primarily with a view to artistic harmony, but each is harmonious and consistent and congruous because of the immanence of one dominating idea.

Nature responds to conditions in a similar way. An apple tree has apple character all thru, and is in no detail to be confused with a peach tree. Again, an apple tree growing on a high wind-swept place becomes in every line different from his brother apple tree of the hollow where conditions are different.

Congruity in nature always, and in art to some extent, is the result of a constant unremitting response to conditions, and usually of a struggle toward a finer adaptation—fitness for service.

During the greater part of its history the human race has had nature to look at—nature and little else. During countless generations man's eyes have been growing accustomed to nature's consistency. Every line in the wind-swept cloud prepares the eye for the next line, every color of the evening hills prepares the eye for the color of the sky beyond. Nature's congruity or consistency is a condition in which the accidental scar is ever being soothed and healed by the unseen hand. In this congruity, then, men's eyes have found repose, comfort, beauty; and the artists whom we call great have embodied this quality in their pictures and buildings and in their pots and rugs and baskets.

This congruity which is found in all things beautiful is a second quality to be sought when we design a book. For it is not enough to make the book merely adequate—it is not enough to recognize merely our first principles of fitness. A thing may be adequate to its purpose and yet exhibit no evidence of the beautiful, which is the supreme attribute of perfection. This congruity which is to some degree incidental to mechanical fitness is to a still greater degree, an esthetic quality. The more delicate choices between color and color and between line and line which make a book beautiful are often so subtle as not to affect its serviceability one way or the other.

In modern design teaching this one element of congruity has received practically all the attention, the principles known as "balance, rhythm, and harmony," being of course principles of congruity. Indeed, design as it is now taught, might be quite correctly known as a "science of artistic congruity."

SIGNIFICANCE.

Any design embodying this quality of congruity together with fitness in all of its parts cannot, from the standpoint of art, be an offensive design. Every line, every color, every bit of material, every constructive device, will be adapted to its place by reason of mechanical necessity, or else by reason of some peculiar appropriateness. Every part will be, so to speak, made to order. Therefore, every part will in some more or less evident way declare its relation to the whole, to the idea underlying the whole, or to some essentially related idea. Every part will be, at least in an incidental way, ***significant.***

Significance, as a conscious, intentional thing, is the last word in design. As in the case of fitness and congruity, the field of "significance" may overlap the others. The elements in a design may, however, be congruous and fit and yet lack the vitalizing quality of significance—the quality which makes the work *completely* an expression, superlatively "an embodiment of the idea," the quality which enriches the mere form and color of all great art.

Children in the schools should come to look for this quality in the works of art they study—knowing that in constructive design as well as in pictorial art, every movement, every color, and every detail has its purpose, its place and its share of meaning. A thoro cognizance of this fact is the only key to a thoro appreciation of any art. The one who quotes Tennyson's line as saying, "When that which drew from out the mighty deep turns again home," may become enthusiastic over the poem "Crossing the Bar," but he does not *appreciate* it. Even the *manner* of touch in the different parts of a drawing or a painting is full of meaning—and he who runs should read.

Of this quality of significance, the third and last of our "principles of design" (if we may appropriate the term) more will have to be said in another essay. Its place in the subject of design is that of the jewel in the ring. It is the ultimate touch. It essentiallizes the meaning of the whole.

THE INSTRUMENTS, MATERIALS OR ELEMENTS OF DESIGN.

Now, as to the working use of these principles of design: What are these choices to which we have referred? What are the commodities concerning which we question ourselves in course of the process of designing?

The elements with which our choosings and our questionings have to deal are, in the main *proportion, movements, colors, textures, materials,* and *constructive devices.* These elements are, so to speak, the designer's instruments. Each of these elements may be used with, or without, fitness, congruity, and significance. Each of these elements is full of suggestion. One material, for example, is delicate, another sturdy; one color or color combination thrilling or major in character, another minor; one form robust, another spirituelle; one constructive device suggestive of tremendous weight and strength, another delicate and airy. (Who has not observed the use of delicate constructive devices by the Japanese, for whose work delicacy has become a synonym, or the misuse of the keyed

mortise-and-tenon joint which has condemned some types of modern furniture?)

The well-designed book, however, gives one complete and single impression with its form and its use in one and the same character.

A diagram setting forth the operation of these principles of design upon the elements of the book-making problem follows:

	FITNESS.	CONGRUITY.	SIGNIFICANCE.
Proportions	Fitness of proportions to purpose or idea to be embodied.	Congruity of proportions with each other and with character of ideas to be embodied.	Significance in the suggestions which the proportions give.
Movements	Fitness of movements to purpose or idea to be embodied.	Congruity of movements with each other and with character of ideas to be embodied.	Significance in the suggestions which the movements give.
Colors	Fitness of colors to purpose or idea to be embodied.	Congruity of colors with each other and with character of ideas to be embodied.	Significance in the suggestions which the colors give.
Texture	Fitness of textures to purpose or idea to be embodied.	Congruity of textures with each other and with character of ideas to be embodied.	Significance in the suggestions which the textures give.
Materials	Fitness of materials to purpose or idea to be embodied.	Congruity of materials with each other and with character of ideas to be embodied.	Significance in the suggestions which the materials give.
Constructive devices	Fitness of constructive devices to idea to be embodied.	Congruity of constructive devices with each other and with ideas to be embodied.	Significance in the suggestions which the constructive devices give.

VI. PROBLEMS FORMING THE FIRST GROUP.[17]

(Continued.)

BOOKS WITH HINGED FLEXIBLE COVERS AND JAPANESE SEWING.

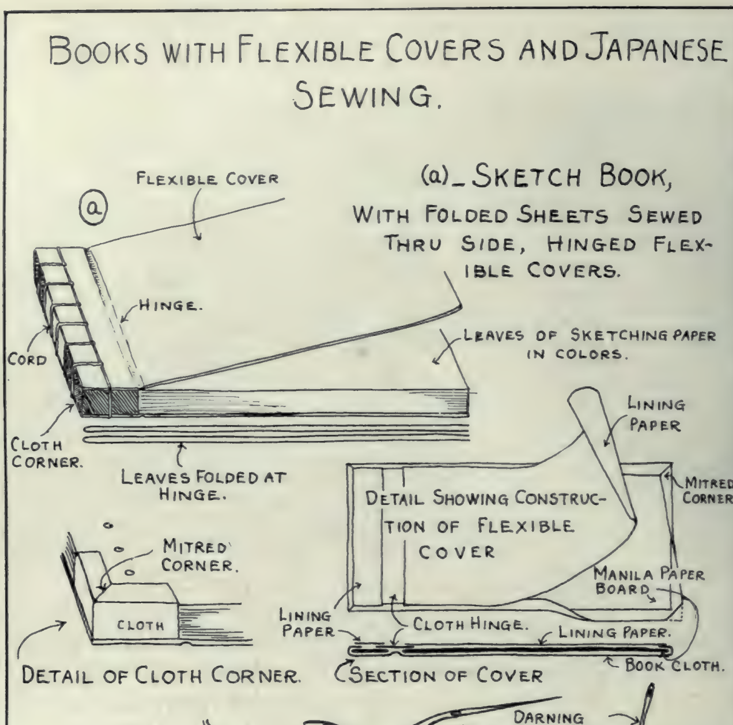
The rebinding of books comes, in the nature of things, as a review of principles of design and construction already worked out. In the rebinding one may note the devices in matters of construction—some of them good, some not—made use of in the trade; likewise something as to kinds and qualities of materials selected for books of different grades. Now and then a book illustrating old time methods may be compared with one showing present-day methods. Comparison of books having certain constructive details may be made with others bound under entirely different conditions, as of books having stapled sections and solid backs, with books made of sections sewed thru the fold and with flexible backs. Children should have, therefore, experience in rebinding magazines and bound printed matter, along with the designing and making of new books.

BOOKS WITH HINGED FLEXIBLE COVERS AND JAPANESE SEWING.

A series of books, examples of sewing sections thru the sides, following the construction lines given in Problem 2, Tree Book,[18] but with added

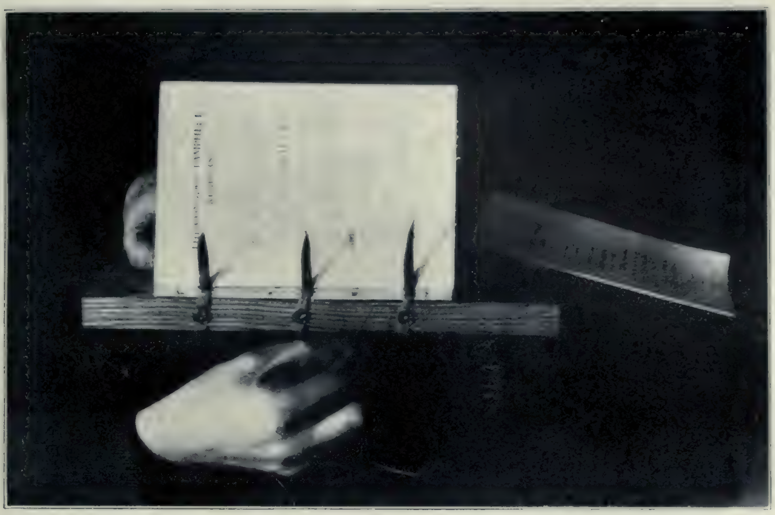
[17] Copyright, 1911, Oscar L. McMurry.

[18] See October, 1910, number; pp. 16, 18, 20.


BOOKS WITH FLEXIBLE COVERS AND JAPANESE SEWING.
(a)_ SKETCH BOOK,
WITH FOLDED SHEETS SEWED THRU SIDE, HINGED FLEXIBLE COVERS.
(a)
FLEXIBLE COVER
HINGE.
CORD
CLOTH CORNER.
LEAVES FOLDED AT HINGE.
LEAVES OF SKETCHING PAPER IN COLORS.
MITRED CORNER.
CLOTH
DETAIL OF CLOTH CORNER.
LINING PAPER
MITRED CORNER.
DETAIL SHOWING CONSTRUCTION OF FLEXIBLE COVER
MANILA PAPER BOARD
LINING PAPER
CLOTH HINGE.
LINING PAPER.
BOOK CLOTH.
SECTION OF COVER
START
DARNING NEEDLE TO DRILL HOLES
DETAIL OF SEWING.
FLEXIBLE COVER.
HINGE.
(b)
LEAVES WITH STUBS.
(b)_ PICTURE BOOK,
WITH STUBBED LEAVES, SEWED THRU SIDE, HINGED FLEXIBLE COVERS.

detail, may be planned by children of the upper grades, to be used for sketches, silhouettes, etc.

11. Book for Sketches or Pictures (Grade VI). Covers hinged and flexible, manila board, linen or book cloth for cover, lining paper, spacing and drilling for sewing or lacing. (a) For sketches, leaves of sketching



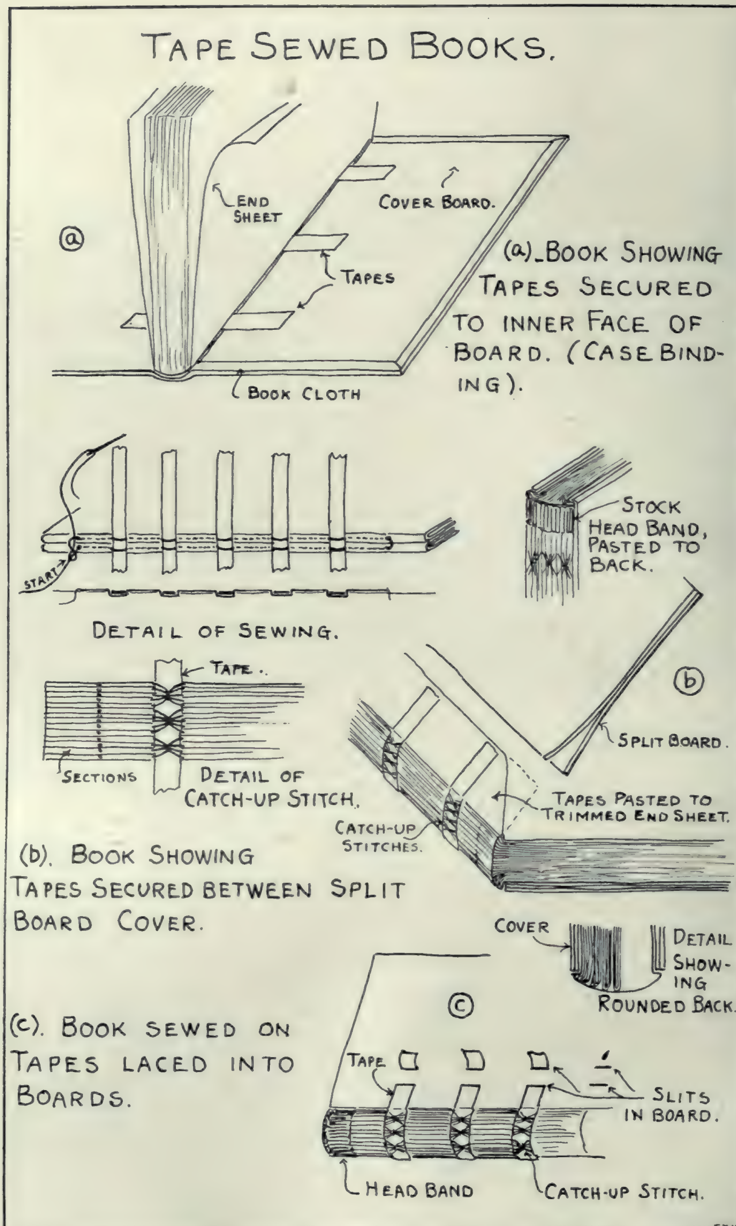
SEVERAL-SECTION BOOK SEWED ON TAPES ATTACHED TO SEWING-BOARD WITH THUMB-TACKS.

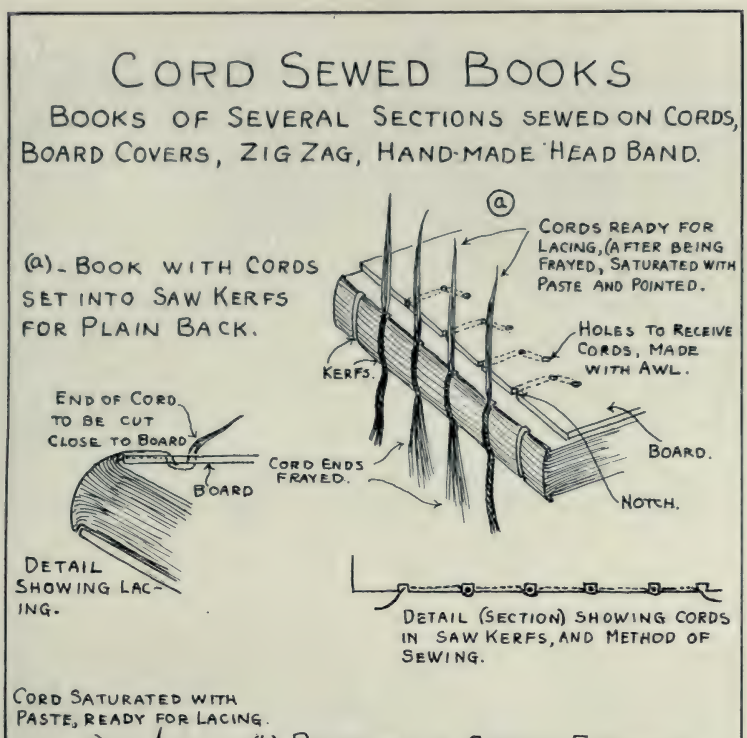
paper in colors, folded at hinge. (b) For pictures, silhouettes, etc., leaves of cover paper folded at fore edge. Stubs of cover paper.

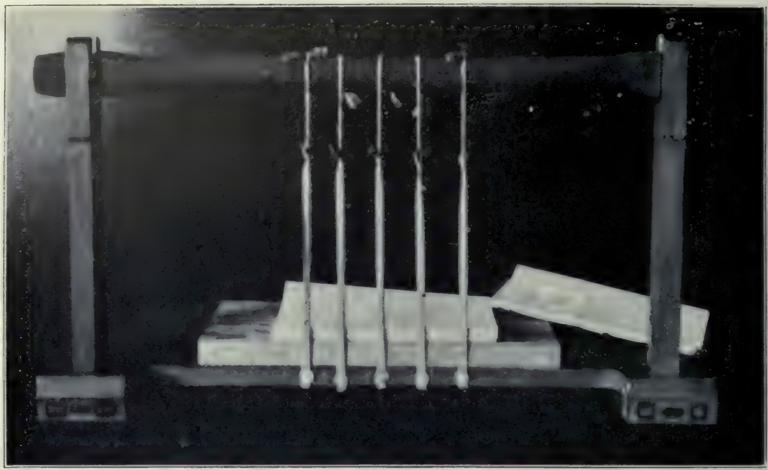
TAPE-SEWED BOOKS.

It may be necessary to bind the sections and covers of a book more firmly together than is possible in thread-sewed books. This may be done in a very elementary way, or if desired more elaborately, by introducing bands or tapes at the back of the book, secured to the back by sewing around the tapes as the sections are sewed. The number and spacing being determined, the tapes may be attached to a board by thumb-tacks for books of few sections or strung in regular sewing-frames for books of many sections.[19]

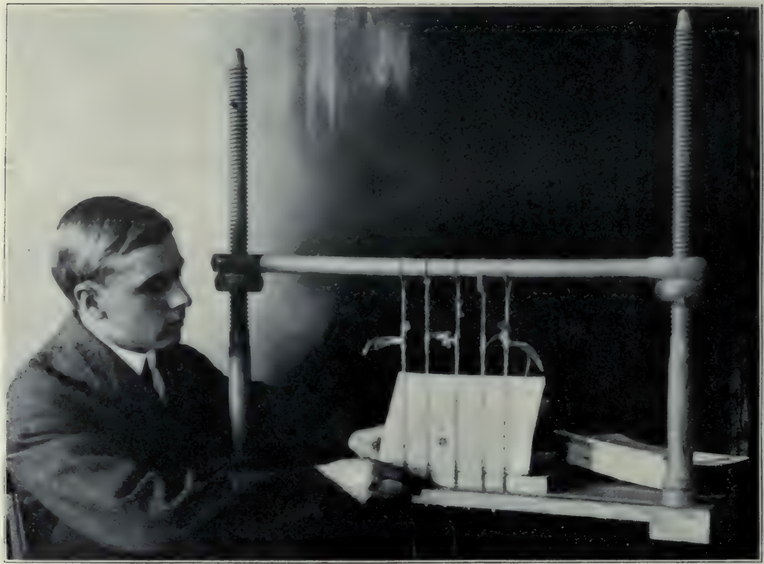
[19] Accompanying illustrations show the sewing-board and sewing-frames designed and worked up in the school shop.


TAPE SEWED BOOKS.
@
END SHEET
COVER BOARD.
TAPES
BOOK CLOTH
(a)_BOOK SHOWING TAPES SECURED TO INNER FACE OF BOARD. (CASE BINDING).
START
DETAIL OF SEWING.
STOCK HEAD BAND, PASTED TO BACK.
TAPE.
SECTIONS
DETAIL OF CATCH-UP STITCH.
ⓑ
SPLIT BOARD.
TAPES PASTED TO TRIMMED END SHEET.
CATCH-UP STITCHES.
(b). BOOK SHOWING TAPES SECURED BETWEEN SPLIT BOARD COVER.
COVER
DETAIL SHOWING ROUNDED BACK.
ⓒ
(c). BOOK SEWED ON TAPES LACED INTO BOARDS.
TAPE
SLITS IN BOARD.
HEAD BAND
CATCH-UP STITCH.
F.X.H.


CORD SEWED BOOKS
BOOKS OF SEVERAL SECTIONS SEWED ON CORDS, BOARD COVERS, ZIG ZAG, HAND-MADE HEAD BAND.
(a)
(a) - BOOK WITH CORDS SET INTO SAW KERFS FOR PLAIN BACK.
CORDS READY FOR LACING, (AFTER BEING FRAYED, SATURATED WITH PASTE AND POINTED.
HOLES TO RECEIVE CORDS, MADE WITH AWL.
KERFS.
END OF CORD TO BE CUT CLOSE TO BOARD
BOARD
CORD ENDS FRAYED.
BOARD.
NOTCH.
DETAIL SHOWING LACING.
DETAIL (SECTION) SHOWING CORDS IN SAW KERFS, AND METHOD OF SEWING.
CORD SATURATED WITH PASTE, READY FOR LACING.
(b) BOOK WITH CORDS FORMING BANDS ON BACK.
CORD, AFTER LACING, READY FOR CUTTING.
CORD CUT CLOSE TO BOARD.
(b)
ZIG-ZAG
DETAIL SHOWING ZIG ZAG.
DETAIL, (CORDS FORMING BANDS ON BACK) SHOWING METHOD OF SEWING.
SEVERAL PLY CORD.
DETAIL OF HAND-MADE HEAD BAND, MADE OF A SEVERAL PLY CORD WITH SILK THREAD WRAPPED AROUND IT, USING BUTTON HOLE STITCH.
LOOPING AROUND CATCH STITCH.
CATCH STITCH
F.X.H.

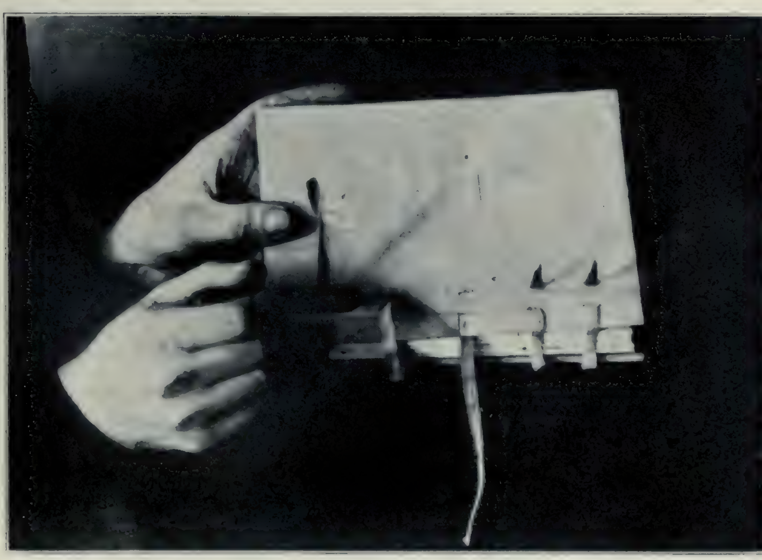


SEWING-FRAME STRUNG UP FOR TAPE SEWING.



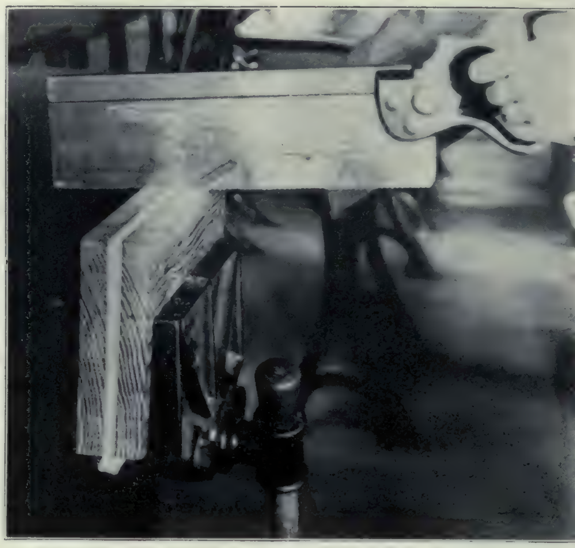
SEWING BOOK ON CORDS.

INSERTION OF TAPES INTO SPLIT BOARDS.
BOOK WITH TAPES PASTED AGAINST INNER FACE OF BOARD.



LACING TAPES INTO COVER OF BOOK.

12. Blank or Printed Books Sewed on Tapes. (a) Books, (Grade VI), may be sewed on board with back glued to hold sections and tapes in place. Tapes are to be pasted to inner face of board covers. Finish with case binding. (b) Books of many sections, (Grade VII), are to be sewed on frame with back glued to secure sections and tapes in

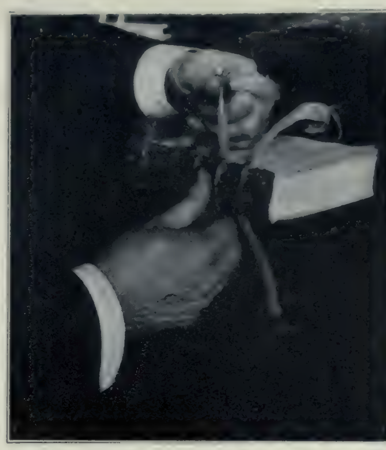


MAKING SAW-KERFS IN BACK OF BOOK TO RECEIVE CORDS.

place. Tapes glued to end paper or waste sheet are to be slipped between boards (split boards) glued together. Covers in place, the back and sides are to be finished in usual manner. (c) Books of many sections, (Grade VIII), are to be sewed on frame. Threads across tapes may be gathered into bundles by catch-up stitches as a means of holding sections more firmly together, and in case of open back giving decorative detail. Bands with decorative edge (head-bands) are glued to head and tail at back to resist strains and to give a finish. Tapes and sections are to be glued and back rounded. Covers are to be attached by lacing of tapes into boards. Tapes may show, if desired, as bands across the back of the finished book or the spaces between tapes may be filled up by pasting on layers of paper so as to give a plain back.

CORD-SEWED BOOKS.

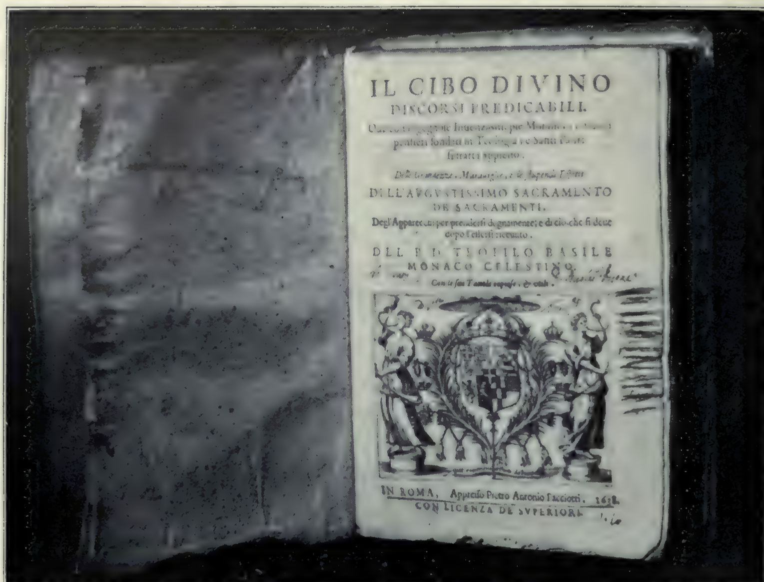
The cord-sewed book gives us the ideal in the matter of sewing book sections and securing of covers to the book. Cords in place of bands break the back into panels for titles, number of volume and name of publisher. The design must determine not only the size, number and spacing of cords, but also whether the back of the book is to be plain or broken into panels. In the case of plain back the cords are to be set into notches or saw-kerfs; if the back is to be paneled the cords are to be set against the back. The rounding of the back and the forming of the flanges to receive cover boards, the marking up of points for drilling holes to receive cord lacings, and the fraying of cords require careful measurements and manipulation.



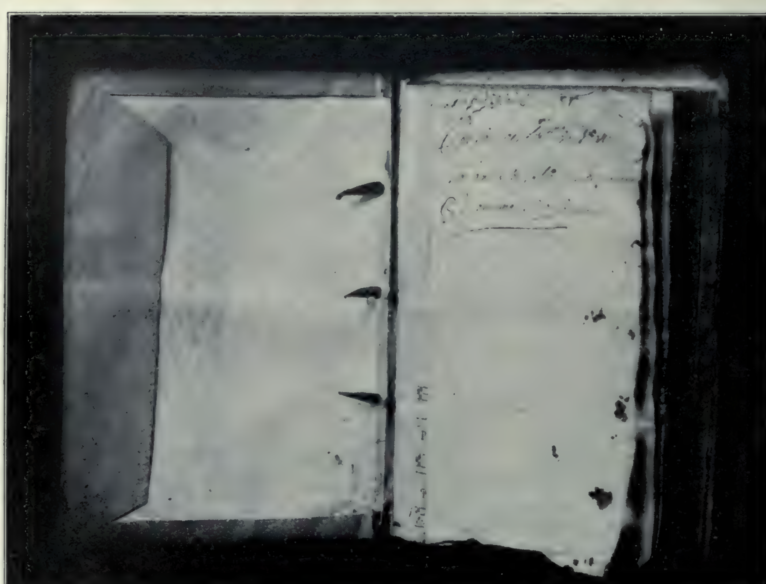
FRAYING ENDS OF CORDS FOR LACING INTO BOARD COVERS.

In opening of books the cloth or leather of the back is either pasted firmly against the back so as to form a flexible back, or is entirely free except at the edge where tapes or cords join the covers. In the latter case the cloth or leather takes convex form as the book opens, while the back of the book is concave. In order to insure smoothness and shapeliness to leather or cloth back as book opens, a strip of strong flexible paper a little shorter than the book and just three times as wide as the book is thick, is folded into three even widths, the center glued to back of book and the other widths folded upon the center piece. This folded strip acting as a form for back is known as hollow back construction. It is necessary that the back of book be rounded and made smooth before the hollow back strip is glued in place.

The introduction of the zigzag or plait at the joint between the cover and book tends to remove the strain due to folding back the cover. The zigzag involves the making of a plait in the outer leaf of end section. The strain on back of books in taking out of bookcase and in handling is in a measure overcome by inserting cords between boards at back of book, wrapping these cords and looping around kettle stitch, thus forming headbands.



BOOK PUBLISHED IN 1638, BOUND IN FLEXIBLE COVER (VELLUM) AND FLEXIBLE BACK.

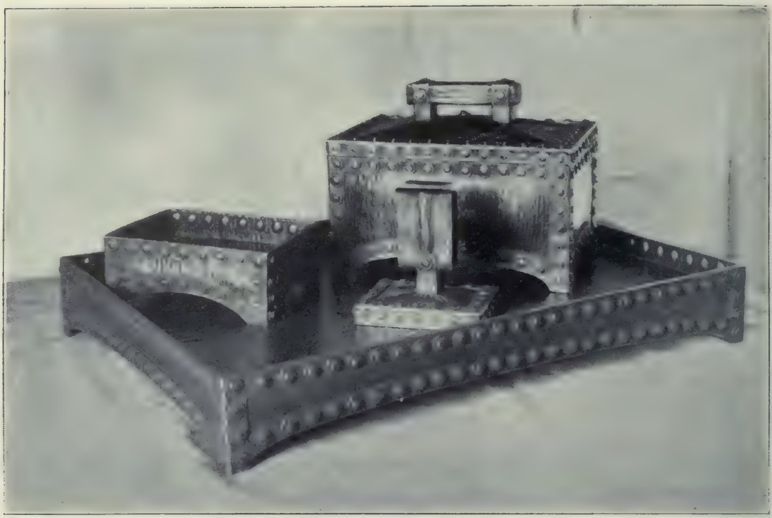


BOOK PUBLISHED IN 1638, SEWED ON CORDS (LEATHER THONGS).

13. Blank or Printed Books Sewed on Cords. (a) Book, (Grade VIII), is to be sewed on cords set into saw-kerfs for plain back. Board covers—zigzags, hollow back—linen or buffing for back and corners, cover paper covers, end papers for lining, stock head-bands. (b) Printed book of many sections may be sewed on cords set against back of book, the cords to form panels on back of book. Board covers, flexible back, zigzag, hand-made head-band, morocco for back and corners, cover papers, lining papers. Blind tooled title.

(*To be continued.*)

SEWING-FRAME DESIGNED AND MADE IN SHOPS OF CHICAGO TEACHERS' COLLEGE.



SMOKING SET.

METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, VI.[1]

ARTHUR F. PAYNE.

THE square smoking set is shown not as a regular problem in this course, but to give some idea of the possibilities that lie in the development of the processes of bending and riveting. It was made almost entirely from flat metal by bending, the only "raising" being on the cover of the box and the base of the matchbox holder, which was done in exactly the same manner as described for the lantern-top. The large tray, the ash-tray and the box, were all made in practically the same manner; a rectangular piece of copper was cut to size; then the corners were snipped out with the shears and the sides and ends bent up, forming the tray or box; the side and end pieces were next cut to shape and fitted; then the brass trimming along the edges was fitted to its place, these together making three thicknesses of metal at the top edge and two at the bottom edge. The holes were then drilled and the rivets put in. This set is also a good example of the means of construction becoming a feature of the decoration.

The fireplace hood shows another possibility of bending and riveting. The design on the front was beaten up from the back with the ball end of the ball-pein hammer. Another problem that may be constructed by bending and riveting is the humidor shown in the photograph. A flat piece of copper was cut to size, bent around and the seam drilled and riveted, the feet cut out and shaped, and a tight-fitting bottom was driven in from the top and held by parts of the edge bent under at the bottom.

HUMIDOR.

The next regular problem in the series we are following is the round plate. This may vary in size according to its use. The card-tray is usually from five to seven inches in diameter and rather shallow. The fruit plate from nine to twelve inches and rather deep, with a wide border.

The method of making a round plate of any diameter is as follows: Cut out of 18 gage soft copper or brass a circle 1/4″ larger in diameter than you want the plate to be; next, lap over the edge 1/8″ all around the flat piece of metal in exactly the same manner as described for lapping the edge of the book-ends, being careful to follow the steps as show in the drawing in June 1910 issue. When lapping over the edge be careful not to strike the hammer on the flat part of the copper, as that will make a disfiguring mark that will show on the finished plate. If it is desired to etch a design around the border, the design must be painted on after the edge has been lapped over, remembering that the design must be painted on the side opposite to that on which the lap is seen. Paint the design on with sapolin; then etch it and remove the sapolin in exactly the same manner as described in the April 1910 issue. Now we have to beat down the depression in the plate. First draw a line with the pencil dividers where the depression starts; then hold the plate on the end of a block of wood and beat it down on the edge of the block with the ball pein hammer along the pencil line, as is shown in the photograph. If the plate is to have a deep depression, it will be necessary to anneal it, as described in the December 1910 issue, because it gets hard while being beaten down. Annealing a piece of work usually makes it dark and dirty, owing to a thin coating of black oxide that forms on copper when it is heated. To clean it, immerse for about ten minutes in a solution of one part sulphuric acid and two parts water; then wash

in running water. Be careful not to get any of this acid solution on the clothes, as it will destroy the cloth. It will not hurt the hands if it is immediately washed off with cold water. Now polish the plate with emery cloth or steel wool, or, better still, with the wire polishing brush costing 30c, illustrated in the photograph, and it is ready for the process of planishing described in the last issue. For the planishing of the plate we shall need the following new tools:

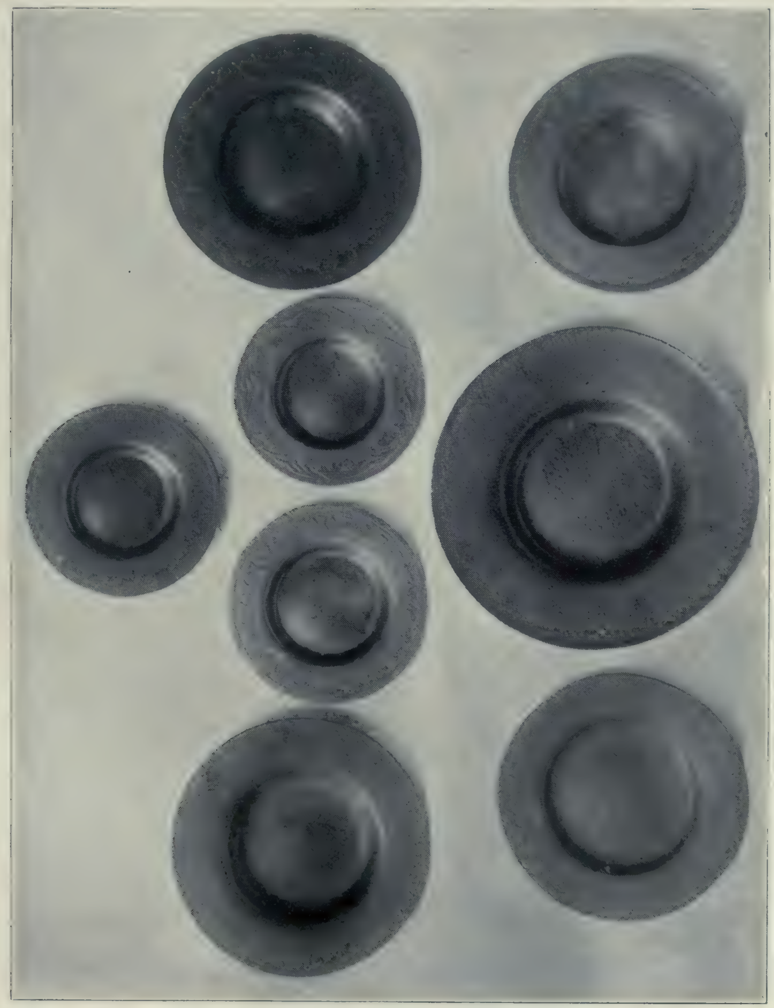
No. 10 bottom-stake, costing 65 cents.

No. 146-A tee-stake, costing 75 cents.

NEW TOOLS REQUIRED.

These are shown in the illustration. After the plate has been well polished, put the No. 10 bottom-stake in the vise and hold the plate on top of it. Start planishing the bottom of the plate in the center with the flat face of the ball-pein hammer, gradually working out toward the edge. Do this planishing carefully, striking lightly with the center of the hammer. It is not necessary to raise the hammer more than four inches away from the plate to get a blow of sufficient force. When the bottom is smooth it should be slightly raised in the center so that the plate will rest on the outer edge of the bottom. To planish the side of the plate put the No. 146-A tee-stake in the vise and planish from the outside, as shown in the photograph. Next, place the edge or border of the plate flat on the lapping-stake, and beat it flat and smooth with the mallet. (Lapping-stake, and mallet illustrated in the June, 1910, issue). The plate is now ready for polishing, coloring and wax-finishing by the previously described methods.

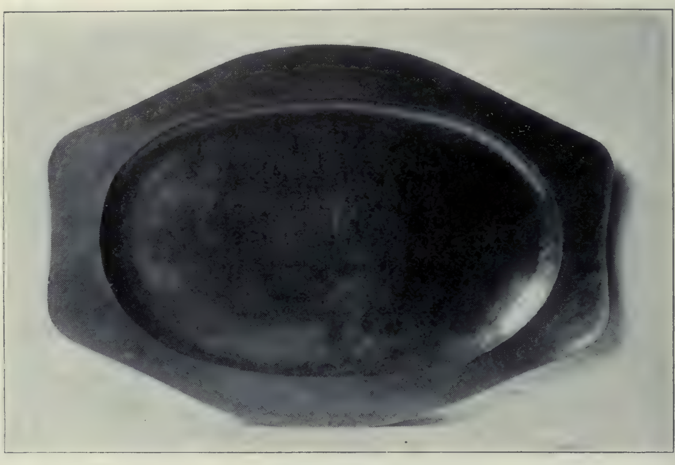
The large oval serving tray in the photograph was made in exactly the same way as the round plate, excepting that the edge or border was planished the same as the bottom. Handles may be made of heavy round wire and riveted on, or holes may be cut out with the saw frame, and the edge lapped. Both of these styles are shown in the photographs.



ROUND PLATES.

To make the fluted and modeled plates shown in the photographs, first lap the edge, then beat down the depression and anneal as described

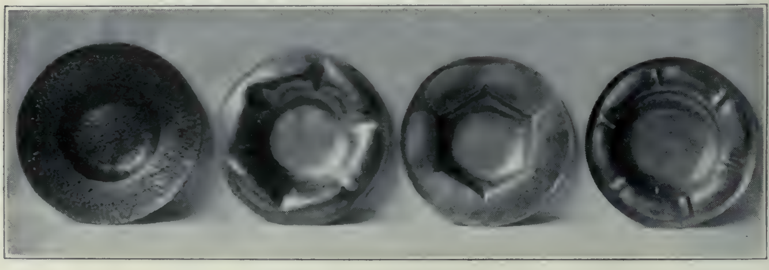
before; then get a piece of hard wood about 8″ long, 2″ wide and 1″ thick, and on the end file a flute the same shape as you wish to reproduce on the plate border, and with the end of the neck hammer that fits the



SERVING TRAY.

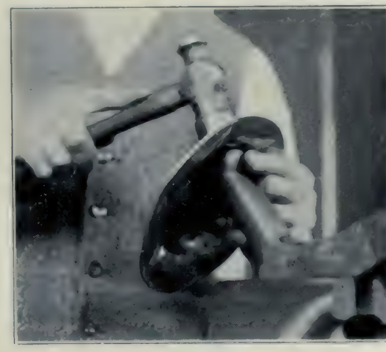
flute best, beat the plate border into the wooden model; then planish and finish..

The rectangular trays are made in a little different manner from the round trays, the method being as follows: Cut out a piece of metal about

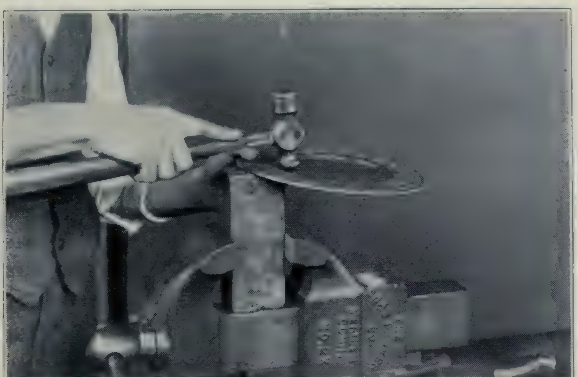


FLUTED AND MODELED PLATES.

½″ larger than you wish the finished tray to be; on the edge of the block of wood beat down the depression with the neck hammer; then cut the tray to the desired outline and lap over the edge; planish and finish. The reason for this difference in method between the round and rectangular trays is that the sides draw in on any square or rectangular piece



PLANISHING THE BOTTOM OF THE PLATE.

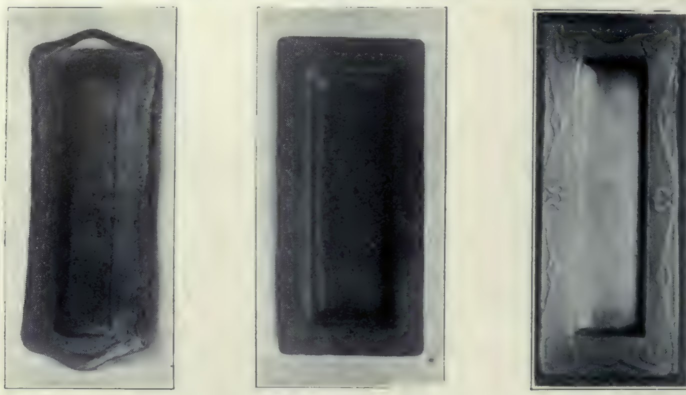


BEATING UP THE ROUND PLATE.

RECTANGULAR TRAYS.

of work in the same way as shown in the drawing of the lantern-top in the last issue.

The problems described in this and the last issue will call for pains-



RECTANGULAR TRAYS.

taking care and attention to details, and as it is not possible to make a good lantern or plate without some previous experience, the easiest and best way is to start at the beginning of the series and make at least one

SERVING TRAY WITH WIRE HANDLES.

of each of the problems described and in that way get familiar with the tools and processes, remembering that it is always better to have one good piece of work than many poor ones.

(*To be continued.*)

THE RELATION BETWEEN AND THE CONTENT IN MANUAL TRAINING AND ENGINEERING SHOP COURSES.

II.

FRED D. CRAWSHAW.

The preceding article made an analysis of the present situation with regard to existing shop courses in manual training high schools and engineering colleges.

The present article attempts to define the character of shopwork for prospective engineers.

COLLEGE PREPARATORY SHOP COURSE.

The secondary school shop course, which prepares for engineering college shopwork, differs principally from the shop course given other students in these particulars:

1st. Students are constantly led to see that their shopwork means to them advanced credit in the engineering college. This means that the high school attempts to duplicate the shopwork of the engineering course.

2d. The shop courses are planned to correlate with the science departments, so that a knowledge of physical and chemical laws is exemplified in the shopwork.

3d. Mathematics is applied in the shopwork and given a turn which leads the student to think of the mathematics-shop combination in future engineering study.

4th. Laboratory experiments are performed in the shop and are given in connection with shop problems as characteristic parts of shop courses. Speed tests and calculations, power measurement and efficiency tests, simple tests in strength of materials—such as bending and breaking under different conditions—and numerous other ordinary laboratory operations are used to embellish and vitalize the shopwork.

Now it must be evident because of the variety of purpose in these high school shop courses, and the self-sufficiency of or lack of real purpose in the engineering college shop courses, that the shop preparation which

the engineer of today gets is either a series of duplications or else a combination of theory and practice, which may or may not meet his needs. With this analysis of the present situation, it is my purpose to outline in some detail certain phases of shop courses which, thru the high school, but more particularly in the engineering college, will be engineering as well as mechanical in character. Before doing this, however, I suggest the following kinds of shopwork thru the high school and college, which seem to me essential for the student who is being educated in the direction of engineering. In doing this I am not supposing that other lines of work might not well be offered. Such other work, however, is not considered of first importance for the student in question.

1st. Woodwork in the following order: Bench-work, including pattern-making, and framing.

2d. Metalwork in the following order: Bench-work, including chipping and filing and sheet metal work, speed lathe hand tool turning and spinning, forging and machine construction with laboratory practice as a necessary adjunct.

3d. Foundry work in the following order: Snap flask molding, loam molding, metal mixing and testing.

It is assumed that in connection with the above lines of work an intimate correlation will be developed between the shops and the science and testing laboratories; otherwise a fourth line of work should be indicated, which would outline the experimental and investigational side of the the shop courses. It is also assumed that problems of economy of labor and production will be made prominent in the above outlines.

Below appear some of the essentials in each of the above suggested courses.

1. WOODWORK.

As manual training is now organized, bench-work in wood is very often begun in the upper two grades of the grammar school and continues thru the first and sometimes thru the first two years of the high school. If this is the case, the course should be so planned for these years that there will be little if any duplication of effort when the student leaves the grammar school and enters the high school. The continuity of the work, as well as its character, should make a lack of interest on the part of the student impossible. Stress should be laid upon the place wood should have in mechanical and engineering work by introducing problems which have a direct bearing upon practical out-of-school problems, and by giving illustrated talks which will forcibly

demonstrate the use of wood in general construction work. It is quite essential in these early years that the student should be impressed with the fact that an accurate determination of sizes in construction is quite as necessary as accurate construction itself. To this end the course should provide for testing wood and different kinds of wood used under different conditions. Without the mathematical knowledge necessary to calculate for safety in construction, simple devices may be planned to show by experimental means the comparative strength of different woods and different sized pieces of the same kind of wood. Such work will early lay the foundation for independent thought and investigation on the part of the student.

At the end of the first two years in the high school, the average student should know how to handle and be able to do good work with the ordinary woodworking tools and machinery. In addition to this, he should have developed a judgment upon wood construction, which will enable him to select the best woods and use the most effective joints for ordinary wood construction that does not involve the use of elementary mechanics. I would exclude from the course up to this point problems in roof and bridge construction, which are sometimes given in high school courses for the first two years.

A course in wood-turning and pattern-making follows the course in bench- and machine-work in wood. Inasmuch as pattern-making involves the use of wood-turning tools, I deem it wise to carry on courses in wood-turning and pattern-making simultaneously. Time is gained by this arrangement and besides, the student applies his wood-turning in a work which has a trade significance and therefore, at least, an engineering bearing.

The usual method of teaching wood-turning is to demonstrate and explain how each of a number of articles is turned. To my mind, the result of this is mentally, as well as physically, a mechanical process. If so, the student becomes by this method an operator thru continued practice. He does not, however, necessarily become a thinking operator. I am sure that in all wood-turning a mathematical analysis is possible, and that the method of teaching it is not by showing the student *how* to turn a particular form, but *why* the tool is used in a particular way to accomplish certain results. The mathematical principle of tangency is the basis of all wood-turning cuts; and when the student has a knowledge of this fact and appreciates its application in the use of each wood-turning tool, he has mastered the art of wood-turning. He may then

acquire skill in wood-turning in a course in pattern-making, rather than by turning exercises which have no meaning for him except as practice work.

For the student who is looking toward engineering as his life work, the *why* of any problem is quite as essential as the *how,* and for this reason, if for no other, the method of approach above indicated is a desirable one to develop a correct mental attitude.

The first work in pattern-making, and the only work in this branch of wood construction which should be taught in the high school, must deal with the principles underlying the pattern-maker's trade. There is so much involved in patternmaking, which requires a knowledge of other trades, that the high school student has quite enough to do to master and apply the principles of shrinkage, draft, finish, etc., together with gaining a correct knowledge of ordinary pattern construction. I would reserve for the college course in pattern-making all work in machine pattern-making, including problems in design, testing and economic production.

The student's shopwork in wood in his engineering college course is limited to a course in pattern-making, suggested in the last sentence of the above paragraph, and to a course in framing. If the student's high school course in pattern-making has been of the character above described, his college course in this subject need lay very little stress upon what has been called, "the principles underlying the patternmaker's trade." He may at once begin the construction of patterns for machine parts. In doing so he should be brought face to face with the problems of design and economic production. In the design of a pattern he must consider the use to which the casting is to be put. This immediately raises the question of strength, and involves calculations and tests under working conditions. He studies the subject of mixing metals and compares the iron casting with the steel casting. He inquires into the present methods of ascertaining why patterns are so carefully designed and redesigned for the castings of model machines, and seeks to improve upon these methods. In short, he is not a pattern-maker alone, but an engineer who is looking for the best possible production as the result of experiments, investigations and such calculations as he may use.

In the construction of the pattern he must be guided by the thought that his patterns are to be used under different conditions of production. Is there to be one casting or many castings to be made from a pattern? Will it pay to make a very substantial pattern or should he use a skeleton

form? Or, perhaps, will a loam pattern be best, when time, expense, and finished product are severally and collectively considered? The construction of the pattern should really be a small part of the college student's work in the pattern-making course. From the larger consideration of his work he must get that broad view which can only be obtained by his placing himself as nearly as possible in the position of the manufacturer or engineer whose success depends upon his bringing to bear upon his problem all the fruits of his own and others' knowledge.

From personal experience as a teacher of a college course in framing, I have become convinced that such a course serves as a climax for school wood-working in engineering courses. The student in his college sophomore year has had descriptive geometry, some mechanics and enough mathematics to solve many of the problems in roof and bridge construction. In the design and calculation incident to the construction of roof and bridge trusses, there is found the meat of engineering work. Nothing, so far as I know, so well serves the purpose of demonstrating the value of the college shop as a part in engineering training, as does a practical course in wood framing. I once had the privilege of designing and building, with twenty-four college students, a frame building having a trussed hip roof,—also a Howe truss bridge. Without further comment upon the subject of framing as a desirable course in wood construction for engineering students, I merely suggest that the problems which were solved in the course above referred to make use of descriptive geometry, graphic statics and some mathematics.

2. METALWORK.

Metalwork of any consequence seldom begins before the second or third year in the high school. If begun at this point, the work is usually in thin metal and is art metalwork in some form or other. The metalwork which may be considered of direct value to the student of engineering tendencies, begins as a rule in the last high school year or the first or second year of college. Little can be said concerning the early benchwork in metal, which will affect present beginning courses already established in elements of engineering principles. It is well that every engineering student should be familiar with as many shop processes as possible. A precise and definite work in chipping, filing, sheet metal pattern construction and hand tool turning, which has a definite relation to similar work in commercial shops, cannot help but be beneficial. Care must be taken not to consume too much time in this work, however, as

it must be clearly understood that such work is given engineering students largely for the purpose of familiarizing them with shop processes. It is not given for the purpose of making skillful workmen.

Forging in engineering courses might be put in the same class as the metalwork just mentioned so far as its purpose is concerned. If I were to criticize the average college course in forging, I would condemn the practice of consuming time in making many things simply for the things themselves, regardless of the kind of work involved in the making. Some schools run to art forging, others to tool making, and so on, but few emphasize in a comprehensive way the use of different kinds of iron and steel and the best methods of handling them in the fire. Much of real value for future engineering work might be introduced in the forge-shop by making comparative tests of heated metals under fixed conditions. I suggest also the introduction of drop-forge work and work involving the use of large pieces of metal under power hammers. The engineer is much more liable to be called upon to deal with heavy metal construction than he is with light metal construction; hence, the necessity of knowledge concerning the manufacture and use of heavy metal construction parts.

It is in the machine-shop, however, where I would suggest the greatest changes in school shop practice. So far as I am able to learn, there are comparatively few of our engineering colleges that lay much stress in the machine-shop upon manufacturing as such, or upon shop methods which may be termed engineering in character. Machine-shop courses as they are at present outlined, emphasize machine manipulation. The average student, when he has completed his machine-shop course, has very little knowledge of how a machine-shop should be organized and operated to produce economic results. He has almost no idea of shop efficiency. He has been technologically taught, but the questions of labor and cost have been ignored in his education. According to the report of the last president of the American Society of Mechanical Engineers, fifty per cent. of the members of the Society are directly connected with the organization and management of capital and labor. It would seem that our machine-shop courses should be designed to apply business methods by correlating properly conditions of commercial economy with conditions of pure technique, if engineering students are to get a proper training for the work which this report indicates they will do. Much of the present work of "muscular effort" and "finger skill" should be substituted by work involving "critical comparison."

The machine-shop course, then, should minimize handwork as such and

introduce more class work and demonstrating work which deals with practical engineering problems. Machines will be run to produce economical results as well as technical results. They will be run under different power conditions and under different loads produced by different tool cuts and speeds. Efficiency tests will be made. Estimates of wear and tear in machines will be made. Judgment will be formed upon operative and maintenance cost. Shop designs and arrangements will be studied. The relation of the power-plant to the machine-shop will be determined, both as regards location and operation. In a word, the student will be trained to observe, criticize and pass judgment upon economic shop management and production, rather than to operate machines as an individual mechanic. By so doing and because he will receive instruction which will contribute toward the practice of his future profession, rather than that of an industrial workman, he will acquire the mental attitude of the engineer.

3. FOUNDRY WORK.

The course in foundry work should be planned upon the same broad lines as those suggested for the course in machine-shop practice. The engineering student is not getting his just deserts, if from his work in the foundry he gets only a knowledge of ordinary job shopwork. This he should get, to be sure, but, comparatively speaking, this will be of little value to him in his engineering growth or in future engineering practice. With, and in addition to this, he must be given the opportunity to "engineer" some problem in foundry practice. Let his course provide instruction in metal mixing and testing, in sweep work and loam molding, in cost computations and in methods of producing castings for "hurry" jobs. Give him the management of the foundry for a day and force him to get results under definite requirements. The foundry affords an opportunity for such an experience with comparatively little danger of serious results.

I feel certain that in the somewhat detailed presentation of the framework of a course of study in woodwork and in metalwork, I have made my point clear. It is my belief that it is only just to the engineering profession that the schools which send men out into the field of engineering should embellish their shop courses by adding practical accompaniments to the commonplace shop technique. In accordance with an old saying, "Where there is smoke there must be some fire;" when we find many of the practical engineers of today complaining of the college preparation of

engineering students, we may safely conclude that something can be done to make this preparation better. I have endeavored to show how the shops may help to do this.

In conclusion I would summarize as follows:

1. So organize the shopwork of the secondary schools and colleges that a definite and continuous line of shopwork thruout both may be established.

2. Let the character of the shopwork be such that the student will live and grow in an engineering as well as in a mechanical atmosphere.

3. Make every problem a possible one, to be dealt with by the student as he will deal with it after he leaves school, when he will be in practical competition with his fellows.

4. Minimize hand skill, but give every student enough handwork in every shop process essential to engineering practice, to familiarize him with the best shop methods.

5. Enrich every shop course with lectures, demonstrations, investigations, experiments, and tests which will give the student a wide-angle view of the shop and its possibilities as a part of an engineer's equipment.

EDITORIAL

WITH the growing popularity of the term "vocational" during the past few months educational discussions have become more and more stimulating to the teacher of manual training. He begins to see the dawn of a great opportunity, yet in some quarters there seems to be a tendency to develop a very irrational competition between manual traning and vocational training, and in others to denounce manual training because it is not wholly vocational in character. A rather amusing case of the latter is found in an address given a short time ago by Charles D. Hine, secretary of the State Board of Education of Connecticut. He is reported to have characterized manual training as "merely another of the innumerable fantastic additions which have been made to the school curriculum. It comes to nothing, and is not intended to come to anything, and it reaches its destination."

Vocational Training and Manual Training The word "vocational" has come into our vocabulary not because general education is a failure, but because general education alone is insufficient to meet our present needs as an industrial nation. Likewise the need of vocational training does not imply the failure of manual training as a means of general education, but merely that under present limitations it is insufficient to meet the demands for practical training in handwork. The same might be said with less emphasis of mathematics and geography; but, owing to the fact that manual training has been looked upon as more vocational than other subjects, it is the natural point of attack for those who do not know the value of manual training or comprehend the breadth and real significance of the vocational school movement. For example, the *Catholic Educational Review* for February sees no conflict between vocational education and liberal education, but under the heading "The Passing of Manual Training" says: "The fact that the National Association of Manufacturers, the National Society for the Promotion of Industrial Education, the American Federation of Labor, and the National Education Association have, at their annual meetings during the past two years, emphatically endorsed the policy of developing vocational education in

our schools, is sufficient evidence that the time has passed for considering whether or not vocational training will supersede manual training." Surely the vocational training movement is not expected to supersede manual training! On the contrary, it should supplement, enrich and help bring it to its true place in school work. We regret to hear of any effort to place the one in opposition to the other or to give undue emphasis to the differences between them. It would be just as logical to place mathematics in opposition to vocational training, for the work in mathematics may or may not be vocational. The degree to which it is vocational will depend upon the after experiences of the persons taught and upon the content and method of the instruction. The same is true of work in manual training.

The Difference

If lines of demarkation must be drawn between vocational training and manual training, we wish that those who draw them would study the address on vocational education given by Dr. David Snedden of Massachusetts at the Oregon State Teachers' Association during the holidays. After defining liberal education as an education that is intended to free the mind, he says:

"Vocational education is any education that fits people to do a particular kind of work in the world—a productive work whereby these people earn a living. The education of a medical college is vocational; the education of a normal school is vocational; the education that trains the bricklayer is vocational; the education that makes stenographers is vocational; the education that prepares a trades worker or a farmer or a woman to manage the household, and whose controlling purpose is to prepare for these vocations is vocational education. We are making a great deal of difficulty at the present time in trying to define as vocational education the things that have very little relation to it. Manual training, for example, has very little relation to vocational education. For a few people manual training is somewhat vocational. Woodworking in woodworking shops may be more or less vocational for the future carpenter, but certainly it is not vocational for the future bookkeeper, or for the future lawyer. That does not in any way detract from the value of manual training, understand. I believe most emphatically in it, but it belongs to the category of liberal education. It is the kind of education that broadens and ripens and deepens the general capacity, but it doesn't fit one directly to earn a living. Very little of our arithmetic, very little of our penmanship, can be considered vocational. You can make arithmetic vocational. When you deliberately set out the kind of arithmetic the farmer or the bookkeeper or the lumberman wants, then you get into a vocational category, for you are deliberately adjusting it for the purpose of these workers."

But manual training is not only the natural point of attack for those who feel that they must combat something in order to build up the

vocational work, but it is also and chiefly the natural basis upon which to build up a large and important section of vocational work. This explains in part, at least, why many of the delegates who were sent to the recent Boston meeting of the National Society for the Promotion of Industrial Education to listen to the numerous papers on vocational training went home and immediately recommended an extension of the manual training facilities of their cities. It is not to be supposed that they considered that in so doing they were acting in opposition to the ideas advanced concerning vocational training. On the contrary, many of them were enthusiastic over the addresses they had heard. But to them manual training was part and parcel of the same thing, and its development was the safest, surest and most natural road leading toward the vocational end desired.

It is easy to see how this popular association of manual training and vocational training seems very illogical and even damaging to certain converts to the new movement and to the makers of definitions, but when one recalls the steps leading up to the introduction of the word "vocational" into our pedagogical vocabulary, the association of the two terms seems natural. In the '60s and '70s of the last century we were clamoring for industrial education; as a result we have drawing and manual training in our public schools. Again we are clamoring for industrial education; the result will be more and better drawing and manual training and some vocational training. The present indications are that the pure trade school will not immediately become an important factor in our public education. It seems clear, however, that vocational courses in one form or another are sure to increase steadily as the result of the present wide-spread demand.

One reason for the popularity of the vocational idea is its comprehensiveness, touching, as it does, and with the possibility of extending, almost every branch of general education. A second is found in the fact that it is in harmony with the expressed desires of organized labor and many social reformers with reference to education. Finally, we find a reason in the fact that, like the term manual training, the term vocational training is sufficiently indefinite and new to allow of many shades of meaning. This is a convenience that has certainly been taken advantage of by public speakers and the daily press during the past three months.

The Manual Training Teacher's Opportunity

With all the popularity of this new term and its natural association with manual training comes an exceptional opportunity to the teachers and directors of manual training. This has been forcefully pointed out by Lewis Gustafson, superintendent of the David Ranken, Jr., School of Mechanical Trades, in a recent address before a body of manual training teachers at St. Joseph, Mo. We quote the following, which not only points out the opportunity, but also, in a measure, the way to meet it:

"The public schools must increasingly train for vocations; that is inevitable. The great task of the public schools from now on will be to coordinate, as never before, with the industrial and commercial life of the community as well as with the intellectual. They must give their pupils an equipment and a training that will be of use to them in earning a livelihood, as well as in the enjoyment of such leisure as may fall to their lot.

"Just how they will do this of course nobody yet knows. My own feeling is that our existing courses in commerce and in manual training point out the way. If we can extend manual training into the earlier elementary grades, devote a large amount of time to it, intensify it, rearrange its content so that it will teach our boys and girls the fundamental and essential processes that enter into all industry, and if we can in the later grammar grades and the earlier high school grades supplement this training by intensive vocational training in groups of allied trades rather than in individual trades we shall have gone far to bring about the thing we are seeking. It is possible, I believe, in woodworking, for instance, to give a boy such advanced practical and theoretical courses in the operations which are common to carpentry, pattern-making, and cabinet-making as will fit him to enter any one of the three with what we may call advanced standing. He will not, of course, be a competent carpenter, pattern-maker, or cabinet-maker without further specialization either in a trade school or in the trade itself, but he will have made a good beginning in all three. He will, moreover, have chosen only a group of trades instead of a special trade and will have gained the inestimable advantage of delaying his choice of a specific vocation until he has arrived at some degree of maturity.

"The same method can be applied to other groups of trades without running up the cost to prohibitive limits and without laying the school system open to the charge of subsidizing certain activities at the expense of others. Along with this instruction naturally will go instruction in the more definite application of arithmetic, science, geography, and history. The commercial and agricultural vocations will of course have to be given a like emphasis. All this can be done without sacrificing the efficiency which the educational system already has. It means simply giving point and direction to what is now being taught in the abstract. It means no sacrifice of culture but rather an increase. It means making the schools more powerful in the preparation of boys and girls for the business of life, which after all is the only reason for which the schools exist.

"That universal vocational and industrial and trade education is bound to come I cannot for a moment doubt. With you, the manual training teachers of

the country, rests the power of giving it impulse and direction. You have the shops and the tools and the pupils. You have the education and technical equipment. You have the legal nine points of possession. It rests with you to say whether separate vocational and industrial schools shall spring up all over the country as they are springing up in New York and Massachusetts, whether separate public trade schools shall be started in all our large cities as they now exist in Milwaukee, Philadelphia, and Portland, or isolated private trade schools supported by private generosity as in St. Louis. And lastly, it rests with you whether, this state of affairs being possible, the industrial workers of our country shall have the advantage of a broad and generous industrial education or be narrowly trained for their vocations and for those alone, whether manual training shall rise to the occasion and become the most vital part of our education in the future or be relegated to the side lines of the country's activities, reserved as a pleasant occupation and accomplishment for the sons and daughters of the well-to-do, degenerating into a sort of masculine fancy-work."

Senator James H. Stout

In our last issue we recorded the death of Senator Stout of Wisconsin. In this issue we present his portrait as a frontispiece, and the following appreciative statement of his life and his work, which has been prepared at our request by Dr. L. D. Harvey, director of Stout Institute:

"James H. Stout, the founder of the Stout Institute, died at his home in Menomonie, Wisconsin, December 8th. His death is a great loss to the educational interests, not only of his home city, but of his state, and the country at large. His work in the public schools of Menomonie attracted attention to them a number of years ago. It was the first city in the United States to offer an opportunity to every pupil in the public schools to have instruction in manual training or domestic art and science from the kindergarten thru the high school. At the time when these facilities were first offered, little was known of either subject in most of the cities of the Northwest, and in most cases where anything had been done, the work had been confined to the high schools. There was no demand for this work on the part of the people in Menomonie. Mr. Stout erected a building, equipped it for both lines of work and employed the teachers to try out the experiment. Very shortly a demand for its extension was developed and he erected a second building, ample in size to accommodate all pupils for instructional purposes in these subjects. In 1897 this building with all its contents was burned, and he then erected the third building and equipped it. It was said by competent judges who had seen the best equipped buildings for this line of work in this country and in Europe that there was nothing in the world surpassing it. He had erected two buildings to be used as kindergartens for public school children and employed the kindergartners to inaugurate that work. This was done at a time when the kindergarten was practically unknown in Wisconsin outside of three or four of the larger cities.

"The work in the Menomonie schools attracted attention and many people visited the city to observe it, and much interest was awakened thruout the

state, and even outside it, for the introduction of similar work elsewhere. There was no institution devoted to the training of kindergartners in the northwestern part of the state, and inquiries as to where kindergarten teachers could be secured were frequently directed to the school authorities at Menomonie. It was decided to open a kindergarten training school to prepare teachers for that section of the state. The school was opened under the auspices of the Board of Education with the understanding that all expenses would be borne by Mr. Stout. This was continued until the state was prepared to open such a department in the normal school at Superior, when it was no longer necessary for it to be maintained by private enterprise.

"In 1903 the work of preparing teachers of manual training and domestic art and science was begun in Menomonie, and has continued until the present time. It was at first under the nominal control of the board of education, but with the understanding that all expenses would be borne by Mr. Stout and not by the city. The work grew until it seemed wise to modify the plan of organization, and in 1908 the Stout Institute was incorporated to carry on the work and other lines related to it.

"The unique thing in Mr. Stout's career was that he was not only a promoter of instruction in the manual and domestic arts in his own city, but that he seemed equally interested in influencing other communities in the same direction. For sixteen years preceding his death he was a member of the state senate and chairman of its committee on education. He had no political ambition and much of the work of the legislature was distasteful to him, yet he was always to be found at his post of duty and remained in the legislature for a number of years primarily with the hope of being able to secure better educational laws and thus to be of service to the state. At his own expense he tried out the kindergarten in his home town. He demonstrated its usefulness to that community and to representatives of many communities in the state. He did not stop here, but secured the passage of laws encouraging the establishment of kindergartens, and making it easy to establish them.

"He put large sums of money into the development of manual training and domestic art and science in the Menomonie schools. During one session of the legislature he secured the use of a large room in the capital and had set up an exhibit of the work of pupils in the public schools of Menomonie. He invited members of the legislature and their friends to examine it. He interested them in it and followed it up by securing the enactment of the law encouraging the introduction of these subjects into the high schools thru direct state aid.

"He was a believer in the value of libraries and in making them accessible to people. He demonstrated his belief by purchasing thirty traveling libraries and sending them out in his own county. He was active in securing the establishment by law of a state library commission to encourage the growth of libraries, and also a law providing for the establishment of local traveling libraries by county boards at county expense.

"He was a believer in better schools for the country boy and girl, and his influence was most potent in securing the legislation that provided for the establishment of the Wisconsin county training schools and county schools of agriculture and domestic economy.

"In the legislature, or outside of it, his influence was for whatever would improve educational conditions, either in school or outside the school. While he was particularly interested in and directed most of his benefactions toward the improvement of conditions in elementary and secondary schools he was one of the best friends the exponents of higher education had in the state.

"In the later years of his life his interest centered largely in the development of the institution which now bears his name. While its principal work is the training of teachers, he was equally interested in its lines of experimental work in the home-maker's school and in the work of the trade school with public school pupils. His mind was busy with large plans for its future development. He lived to see in it a larger number of young men and women preparing themselves as teachers of the manual and domestic arts than could be found in any other institution in America. While this pleased him, he was far more interested in the quality of work done than in the number of people in the institution.

"He will be sorely missed by those who have been associated with him, but his influence will long be felt, not only in his own state, but thruout the United States."

ASSOCIATIONS

SCHOOL CRAFTS CLUB.

The second stated meeting of the School Crafts Club of New York City was held on Friday evening, January 13th, 1911, at the Atelier Building, 33 West 67th Street.

During the regular business session a movement was put on foot that seemed to call forth considerable discussion and interest. It was proposed and carried that the Club undertake the publication of a bulletin three or four times each year, the purpose of which would be to distribute among the members information of immediate interest. This will include: (1) The roll of the Club; (2) bibliographies; (3) notices of meetings, societies, and exhibits; (4) periodical and book reviews; and (5) articles of interest by members of the Club.

It was felt that such a publication would prove of value to the members and furnish opportunities for community work that would sustain interest in the Club. The first issue was planned for some time in February.

After the business session Dr. E. B. Kent, chairman of the literary program, introduced the subject for the evening, "Methods of Handling Certain Constructive Projects with Elementary Classes." He said that the Club had had in the past a number of meetings discussing the "why" for the introduction of some particular phases of mechanical work into the shopwork, but that it was the purpose for this evening to tell somewhat in detail the "how" of some definite problems of this nature.

"A Model Aeroplane" was the theme of a talk by I. Schneider, of the New York City schools. He explained the construction of base, wings, motor, and propeller of a simple monoplane, a number of which have been made in School No. 77. Several models were exhibited and explained, and examined by the members of the Club. Photographs of more elaborate models, made at the same school, were passed around also and much appreciated. The speaker said that a good introduction to this study would be thru the making and studying of kites and, indirectly in this way, the pressure of air currents; also, still nearer to the aeroplane, thru the making of a model glider. During the discussion the speaker was asked many questions about the model, the handling of classes in such work, kite contests, and the technical side of aeroplane construction.

The second speaker, W. P. Kent, Jersey City, exhibited and discussed "A Soft Metal Steam Engine." In order to dispel any doubts as to the practicability of the project the speaker demonstrated that the engine would run even with lung power. He showed in detail, by means of parts, patterns, flasks, and charts of mechanical and perspective drawings, how the particular project was handled at the Ethical Culture School, New York. The engine is of the slide-valve type, having the same essential parts as any commercial engine, and the speaker claimed that the work would give the pupils good, stiff drill in the use of tools and have besides a larger interest and broader field for study than many of the projects

usually found in the eighth grade. During the discussion the speaker answered the usual volley of questions.

E. F. Judd, Montclair, N. J., spoke on "Cement and Concrete Construction as a Manual Training Problem." In a brief review of the history of cement and its uses he showed what an important and lasting place this useful material has played in the life of the human race. He explained briefly the manufacture of cement, and set forth the reasons for its use as study as a manual training problem. The fact that it is used so extensively in the building trades, which afford employment to the large bulk of the race, justifies its use as a medium in the shop. The speaker exhibited models and photographs of a number of objects made in the Montclair schools. These included flower-pots for window and lawn, building blocks, birdhouses, sundial standards, lawn-rollers, and hitching-posts.

Mr. Judd explained the various uses of the materials, methods of handling classes, and testing schemes for cement. A bibliography of material on cement work was passed around to the members and indicated the wealth of available printed matter.

The Club is to have a series of round-table discussions during the year to enable the members to discuss more thoroly subjects of mutual interest. At the first, held in February, thse topics were presented: (1) Formal Exercises; (2) Mechanical Problems; (3) High School, and Art Work.

—FRED P. REAGLE, New York City.

OKLAHOMA MANUAL ARTS ASSOCIATION.

The Oklahoma Manual Training and Drawing Association held its annual meeting in Oklahoma City, December 29-30, 1911, at which time it was decided to change the name of the organization to the Oklahoma Manual Arts Association. The secretary was authorized to publish a full report of the proceedings of the meeting, to be ready for distribution by March 15th. The following officers were elected for 1911: President, V. O. Wilson, Central Normal School, Edmond; Vice-President, Charles T. Jennings, Claremore; Secretary, L. P. Whitcomb, Southwestern Normal School, Weatherford; Treasurer, Brownlow Hopper, Oklahoma City; Member of the Executive Committee, M. S. Sweet, Lawton.

PENNSYLVANIA EDUCATIONAL ASSOCIATION.

The Manual Training Section of the Pennsylvania Educational Association met in Harrisburg, December 28-29, 1910, with two sessions instead of one, as has been the custom heretofore.

On Wednesday morning the subject for discussion was "The Manual Arts as Taught in the Pennsylvania Normal Schools." A request had been sent to the principals of the fourteen state normal schools asking that the heads of the manual training departments present at this meeting reports of the work carried on in the various schools, together with suggestions for possible improvements in the work.

The result of the discussion was the adoption of the following resolution:

"WHEREAS, The demand for instruction in the manual arts is increasing, and the instruction must, in many instances, be offered by the regular teachers; and

inasmuch as this demand is growing to such an extent that in the near future teachers who have had no instruction in the manual arts will be seriously handicapped in securing positions; therefore, be it

"*Resolved,* That we hereby recommend that in all Normal School courses in the state of Pennsylvania there be a minimum requirement of training in the manual arts equal to five recitation periods per week for one school year; and be it further

"*Resolved,* That a copy of this preamble and resolutions be sent to the principal of each Normal School in Pennsylvania by the secretary; and, further, that the said preamble and resolutions be sent to the General Committee on Resolutions of this Association, with the request that the same be embodied in its report."

A lecture, illustrated by lantern-slides, on "Some School Shops and Their Equipment" was given by George C. Hubbard, of the Oliver Machinery Company.

The Thursday afternoon session was given to discussion of the following topics: "Solving the Skilled Mechanic Problem:" (a) "By Endowed Trade Schools," Harry S. Bitting, Director Williamson Free School of Mechanical Trades; (b) "By Public Trade Schools," William C. Ash, Principal Philadelphia Trades School; (c) "By Schools Furthered by Manufacturers," C. R. Dooley, Educational Director Westinghouse Electrical and Manufacturing Company, East Pittsburg.

On Wednesday evening, at the general session of the Educational Association, Chief Authur D. Dean, Division of Trades Schools, New York, spoke on "The Establishment of Forms of Special Education," as one of the functions of a State Board of Education.

The next meeting of the Manual Training Section will be held in Philadelphia in December, 1911. The following officers were elected: President, Thellwell R. Coggeshall, superintendent of mechanical schools, Girard College, Philadelphia; Secretary-Treasurer, Lewis W. Cruikshank, Friends Select School, Philadelphia.

—Iris W. Prouty,
State Normal School, Millersville, Pa.

WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION.

Preparations on a large scale are under way for the entertainment of the eighteenth annual meeting of the Association at Springfield, Illinois, May 2-5, 1911. The demand for exhibit space has been so great that practically the entire floor of the immense State Armory will be used for this purpose. For programs and bulletins address the secretary, Miss Bertha L. Patt, State Teachers College, Cedar Falls, Iowa.

SHOP PROBLEMS

GEORGE A. SEATON, Editor

POTATO MASHER.

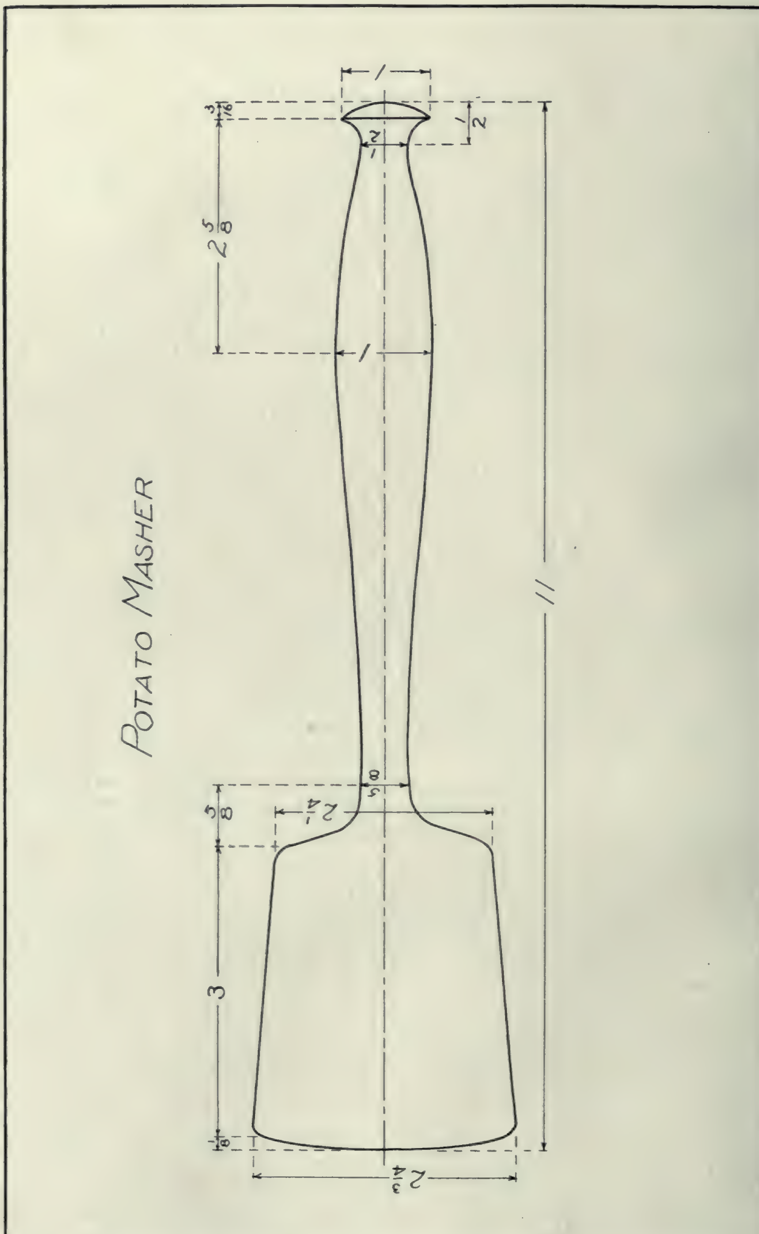
The potato masher has long been designed for service but has seldom had much of beauty. The design here offered has a certain grace and lightness in its finished form which do not seem to militate against service.

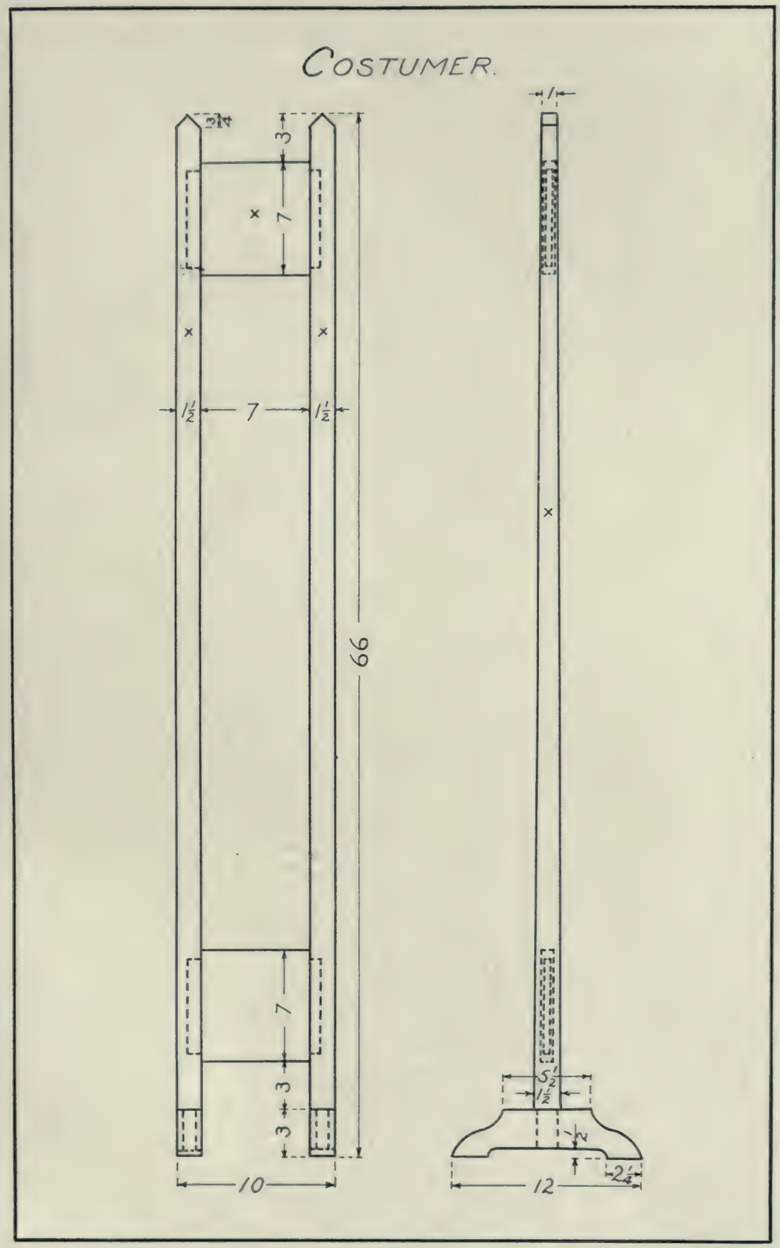
COSTUMER.

The costumer shown is very simple in its construction but affords a variation from the usual one with a single central post. As shown, the posts taper slightly in one direction. The mortises should be laid out before planing this taper. If preferred, the posts can be made square thruout their length. The crosses upon the working drawing indicate the location of the hooks.

STOOL.

The first-year high school boys of Worcester, Massachusetts, have been making the stool shown in this issue for the past two years. A. F. Ball, under whom the work was done, reports that the problem was quite as popular among the parents as among the boys. The design is that of H. W. Leland, of Leominster, Mass. The seat is made of five-sixteenth inch flat reed, which is wound around rails formed from one-inch dowel rods. All joints in the reed are made on the under side of the seat. A number of different patterns in the weave are possible. If the weave is in blocks of four the number of strands between the legs each way must be a multiple of four. If the weave is in blocks of three, the number of strands must be a multiple of three.


POTATO MASHER


COSTUMER.
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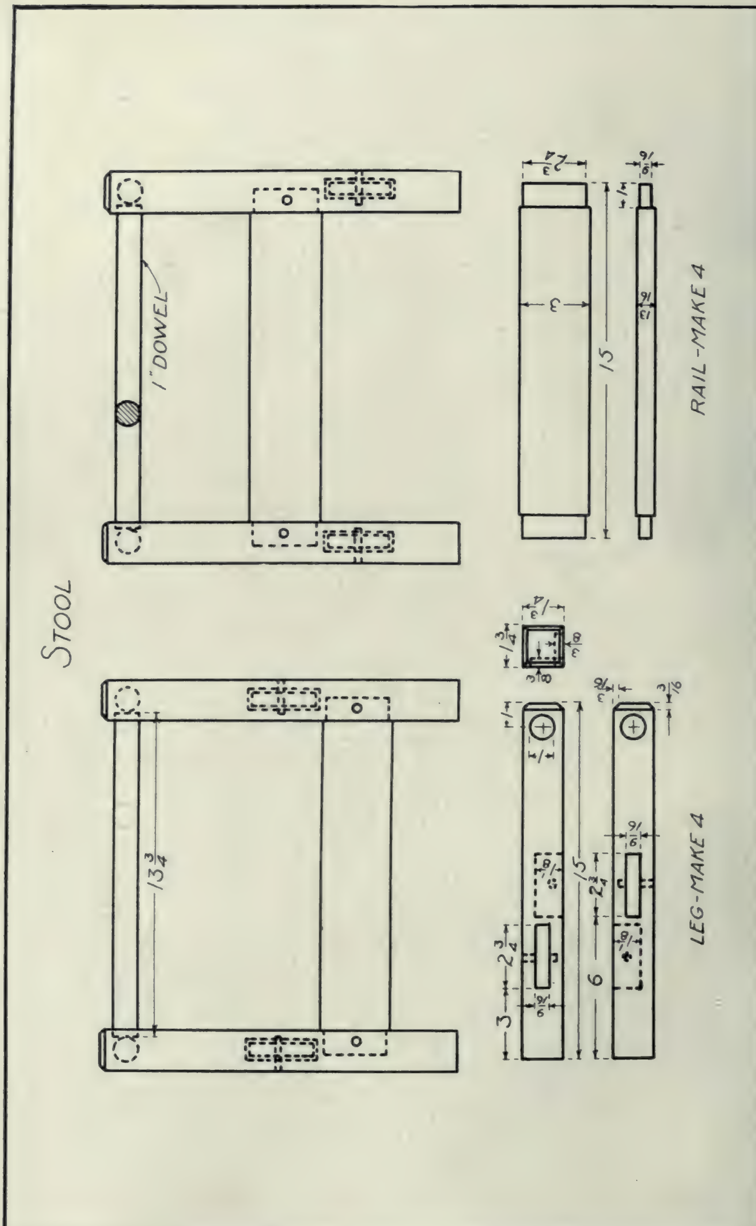
STOOL
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RAIL-MAKE 4
LEG-MAKE 4

CURRENT ITEMS

According to reports published in a Chicago paper, German capitalists are about to establish a chain of engineering schools in China. Banks and manufacturers have subscribed liberally to the fund of half a million dollars to carry out this project. In Germany business and education have been welded into a powerful implement for the furthering of national success. This latest form of strategy in the Orient should not be lost sight of by other ambitious nations. It is better than war, and may be more lasting in its effect.

The oldest American labor organization is the International Typographical Union. It maintains a home for aged members, a tuberculosis sanitarium, besides a pension system which is of great benefit to the aged members. This organization also maintains a correspondence school which now has 1800 students. In order to keep up with the development in the printing arts the worker in printing establishments must be more than a mere copyist. He must know the principles of design and of color harmony, in order to grow into the best positions now opening. Realizing this, the union has developed a very strong course in art as applied to printing.

NORTH ATLANTIC STATES.

About a year ago the city of Boston opened its first continuation school as an experiment with the cooperation of the leather and dry goods trades of the city. A recent issue of the *Boston Globe* gives the following outline of the subjects taken up in this school:

"The shoe and leather course includes the production and distribution of leather, tanning processes, leather manufacture, recognition of kinds, grades and comparative values of leather manufacture and classification of shoes, commercial arithmetic, commercial geography, commercial correspondence, salesmanship and efficiency training.

"The dry goods course includes fibers, cotton and cotton goods, wool, worsted and woolens, silk and silk fabrics, linen and linen fabrics, recognition and comparison of mixed fabrics, simple tests for determining quality, coloring materials and colors, preservation, care of stock, commercial arithmetic, commercial geography, commercial correspondence, salesmanship and efficiency training.

"The course in preparatory salesmanship includes commercial correspondence, facility in oral and written expression, store arithmetic, sales slip practice, sources of merchandise and its distribution, raw materials, textiles, penmanship, design and color, hygiene, practical talks on the fundamental principles of success and salesmanship."

In developing the manual training work in Springfield, Mass., Mr. Egbert E. McNary, the supervisor, is giving considerable prominence to metalworking. He believes that the elements of metalworking offers just as great educational possi-

bilities as woodworking, and equally good hand training. He is also extending the work in the direction of concrete construction and printing. In one of the public schools the boys have made the concrete walk adjoining the entrance to the school. These newer processes are being taken up in order to give a broader industrial significance to the work in manual training.

It is encouraging to learn that the advocates of vocational training in Massachusetts are not forgetting the manual training work in the lower grades of the elementary schools. In an article by Charles A. Prosser, deputy commissioner of education in charge of industrial education in Massachusetts, published in the *Boston Globe* in November, there appears the following statement:

"Manual activities in the lower grades will serve as a basis of right teaching; in the upper grades they will serve the additional aim of vocational direction. In the upper grades of the elementary schools, beginning with the seventh grade, the children might well take certain studies together, differentiating so far as facilities will permit in others.

"Girls returning home to mother at fourteen might well take the rich courses in domestic science and art, first aid to injured, sanitation and hygiene.

"Boys expecting to enter upon business life at fourteen should be offered opportunity for training in commercial arithmetic, commercial geography and the keeping of simple accounts. Boys entering industrial life at fourteen or who expect to attend industrial schools should have rich courses in mechanical drawing, manual training, industrial geography and arithmetic.

"In these grades under careful direction each would find his bent and tendency. Such courses would place in the hands of the school authorities information on the basis of which wise vocational direction could be given."

One of the surest ways to bring about reform in education is to present facts. This is illustrated in what followed a report recently made in the city of Somerville, Mass., concerning the number of girls that have left school during the past year. A canvass was made under the direction of the State Board of Education, which has led to the conclusion that an elementary industrial school for girls should be established in Somerville. During the past year 251 girls under sixteen years of age have left the schools of Somerville to go to work. Four years ago 187 girls left for the same purpose. A comparison of the figures shows that the number of girls leaving during the past year is 34 per cent greater than that of four years ago. During the same period there has been an increase of only 13 per cent in the population of the city. Of the 251 girls who left this year, 60 per cent were only fourteen years of age; 9 per cent had gone beyond the grammar grades, and 7 per cent left school before reaching the sixth grade. From personal visits to 146 homes it was found that 50 per cent of the girls might have gone on in school work had they desired to do so. Dissatisfaction with the opportunities presented by the regular curriculum and not economic necessity is the reason why 6 per cent had left school. The parents of these girls desired them to have more education, but thought that a training was needed which would prepare the girls to become self-supporting in a year or two. It has been proposed to establish

a two-year industrial school course covering dressmaking, millinery, machine operating, and possibly other technical subjects. The course would also include academic subjects intended to enrich or broaden the training of the school.

What promises to be a very remarkable and striking record of the place of science in modern industry will be presented in the series of papers which will constitute one of the main features of the Congress of Technology to be held in Boston on April 10th-11th, of this year. The first of these dates is the fiftieth anniversary of the chartering of the Massachusetts Institute of Technology, and the primary purpose of the Congress is fittingly to mark that anniversary. The papers will constitute a survey of engineering and industrial science as a whole, from a body of men who speak from first-hand experience with industrial problems all over the country. No similar discussion of the industries has been attempted on such a scale, and the record promises to be of unique suggestive value.

Harvard University is to offer a summer school course this year on the theory and practice of vocational guidance. This will be given by Meyer Bloomfield of the Vocation Bureau of Boston. The underlying purpose of the course is to develop in the schools what President Emeritus Eliot calls the "life-career motive."

In a recent address Mr. Charles A. Prosser, deputy commissioner in the state of Massachusetts, said that there are forty thousand children between the ages of fourteen and sixteen in the state of Massachusetts who are wage earners. Of these only one out of six has reached the eighth year of the public schools; one out of four has reached the seventh year, and one out of two has reached the sixth year. All of these are without any industrial training. It has been found that eight out of ten of the parents of these children would have sent them to school longer if the school available were of such a character that they considered it worth while to make the sacrifice. These children, as a rule, are not able to enter a desirable occupation. They naturally drift into occupations where there is little chance of working up.

The High School Teachers' Association in New York City has a student's aid committee which is doing a work of increasing value. Indeed, it has become so valuable that it might easily grow into an employment bureau for the boys of the public schools. The aim of this committee is to bring the attention of employers of labor to the various kinds of training given in the public schools and to ascertain from principals, and teachers, and in some cases from the students themselves, the kind of work for which each is best suited, and then to place each student in the position in which his talents will have full scope to develop. Frequently employers criticise the public schools because they do not employ the kind of boys that the teachers recommend, and it frequently occurs that a boy secures a position which is not at all suited to his capacity. The students' aid committee is doing much to improve this condition.

In July, 1909, the school districts of Cheltenham Township and Jenkintown Borough, Pa., both suburban to Philadelphia, combined to employ C. E. Karlson,

then of Altoona, Pa., to take charge of the manual work in their schools. Mr. Karlson spends three and one-half days per week in Cheltenham district and one and one-half days in Jenkintown. In both these districts a full course of industrial work is taught, beginning with the first grade and ending with second year of the high school. In the Cheltenham high school an additional year's work has been planned. Mr. Karlson teaches all the work from the seventh grade up, and supervises the work of grades I to VI. This combination has been very satisfactory to both districts and has given each the services of a first-class man who would hardly have been available in any other way. When districts are situated as these are, and the boards are sufficiently progressive to lay aside petty jealousies, and when they are willing to pay a first-class salary, there is no reason why this combination should not be effected. It should be added, however, that in all probability such an arrangement would not work in districts whose boards are not willing to turn over the entire management of the professional side of the schools to the principal or superintendent.

BELLEVUE AVE. SHOP, MONTCLAIR, NEW JERSEY.

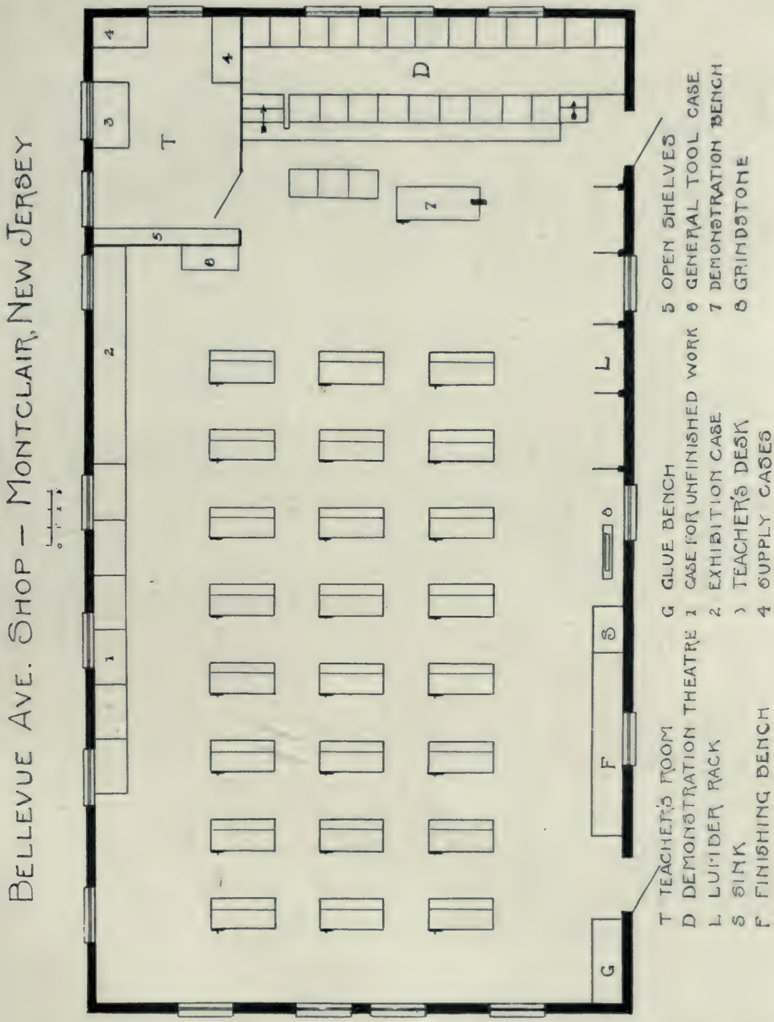
A GRAMMAR SCHOOL WORKSHOP.

The school workshop has been made the subject of considerable study. Every new center is the more or less satisfactory solution of the problem of arrangement of equipment in a given space. It is an effort to provide the means of handling a class with the least amount of waste in time, to provide facilities for the storage of supplies and tools, and some way of safely keeping unfinished work during the time when the class is not at work.

The shop shown in the accompanying illustration is one of six in the town of Montclair, N. J., and what is said about equipment holds true of the others. It is unique in that it is housed in a structure especially built for the purpose. This shop measures 29x54 feet, and, having windows on all sides, allows the arrangement of equipment with but little reference to space or light. The equipment consists of twenty-four single benches with the usual tools, and a few essentials

for simple metalwork. The benches are partially equipped with rapid-acting vises, the old wooden ones being replaced as they wear out.

The demonstration theater was designed for a class of twenty, but larger classes have made twenty-five seats necessary. The demonstration bench has both



woodworking and machinists' vises. It is used also by students for such metalwork as comes in connection with the shop projects. This bench is provided with drawers for tools and compartments for sheet metals, etc.

The lumber rack was made by bolting five pieces of 4x4-inch chestnut to the

side wall, and inserting six 21-inch lengths of 1¼-inch gas pipe in each upright. Such a rack is convenient, serviceable and inexpensive.

The glue and finishing tables, not shown in the pictures, have zinc tops, and are provided with drawers and compartments for keeping the materials used. They provide the means for doing with cleanliness and order what sometimes is a rather troublesome part of shopwork.

INTERIOR OF BELLEVUE AVE. SHOP, MONTCLAIR, NEW JERSEY.

The permanent exhibit case measures 20 in. by 5 ft. 6 in. by 12 ft. It has adjustable shelves, glass doors, and is provided with the same style of lock as are the general tool case, supply cases and demonstration bench.

The cabinets for pupils' unfinished work have been planned to meet the problem of providing a satisfactory place in which a pupil can keep his work from lesson to lesson. The first requirement of the shops seemed a standard size locker; secondly, it must be adjustable to provide for various sizes of projects; and lastly, local conditions demanded a system which could be moved without difficulty. The idea has developed into what is the most satisfactory system with which the writer has had experience, either as teacher or student. A sectional case was designed which meets equally with the needs of all classes in the art and handwork department, whether they be bookbinding, woodwork or sewing. Each section measures 20 in. by 24 in. by 36 in. The open case in the illustration shows the maximum number of compartments, eight pupils to the section, each pupil having a space 8¼ in. x 10⅝ in. x 18½ in. for his work. By removing four or six of the upright partitions, the space may be given to four or even two pupils. Thus any piece of work up to 11 in. x 18½ in. x 34 in. can be kept out of the way and under

lock and key. Alternate sections are assigned to a class to avoid congestion and confusion.

The cost of the building several years ago was $3,500. Local carpenters built the demonstration theater, lumber rack, cabinets, etc. The demonstration bench cost $27; the stain and glue tables approximately $4.50 per running foot; and the unfinished work cabinets $12 per section. These prices could without doubt be materially reduced where lumber is less expensive and where woodworking industries abound. —ALBERT F. SIEPERT.

SECTIONAL LOCKERS, MONTCLAIR, NEW JERSEY.

NORTH CENTRAL STATES.

Recent developments in educational circles in the state of Wisconsin and those likely to take place soon look toward an unprecedented interest and activity in the manual arts for the near future.

Under the auspices of the School Arts and Home Economics Section of the Wisconsin State Teachers' Association, a committee is at work on a course of study in the manual arts. At present outlines of courses of study covering drawing and the different lines of shopwork for all grades from the kindergarten thru the high school have been drafted. None of these are ready for publication, but the present committee working upon them held a meeting in Oshkosh on the occasion of the recent meeting of the Northwestern Teachers' Association and planned a progressive line of work to be done during the ensuing year looking toward the ultimate publication of the report. Whenever publication is made, however, emphasis will be laid upon the fact that the outlines in the report are suggestive and tentative only. It is to be hoped, however, that they will serve as a means of vitalizing and to some extent standardizing the work of the manual arts in the state.

In the near future a bulletin on the teaching of the manual arts will be issued from the University of Wisconsin as one of the high school series. This bulletin has been prepared by Professor F. D. Crawshaw of the University of Wisconsin, assisted by Professor R. W. Selvidge of the University of Missouri. It will contain many outlines for courses of study in drawing and shopwork. These outlines will represent not only the combined individual views of the authors, but the collective views of many teachers and supervisors in the Central West.

The faculty of the University of Wisconsin has voted to accept for purposes of entrance credit four units of high school work in vocational studies. These include manual arts, domestic science, commerce, and agriculture. A student may, therefore, if the regents of the university approve the action of the faculty, enter the university with credit given him for four years of high school work in any one of the subjects mentioned. Credit will be granted, however, only when the high school work has been approved as a result of university inspection. A student may also present four units for entrance credit by combining two units in one of the four vocational studies mentioned with two units in any other one of the four. No other four-unit combination can be made.

The department of manual arts established in the University of Wisconsin at the beginning of the present academic year has been instrumental in having authorized by the faculty of the College of Letters and Science, a four-year course of study leading to the degree of Bachelor of Science. The completion of 132 units of work are necessary for the granting of the degree. Of the 132 units, approximately 80 are prescribed, leaving 52 for free election. Of the 80 prescribed units, 39, which constitute the manual arts major, must be earned within the department of manual arts.

The present state legislature will have an opportunity to take action upon a bill which has been drafted to provide for the establishment of continuation and vocational schools within the state.

It thus appears that the people of Wisconsin will soon have an opportunity to develop the manual and industrial arts within the public high schools and in vocational schools of the continuation school type as few other states can do under present conditions. Already there are many well organized high school departments in which manual training and drawing of a high grade are being taught.

Governor A. O. Eberhart of Minnesota is a strong advocate of the consolidation of rural schools because he believes it to be the only effective means by which opportunities to secure an efficient and practical education can be placed within the reach of the boys and girls on the farms. He says: "The common schools do not equip the boys and girls for agricultural pursuits, and, inasmuch as trade schools are too expensive, the only solution of the question remains in the consolidation of our rural schools. Under this system it will be possible to incorporate these advantages in the curriculum of the rural schools."

An interesting movement has been started in Kansas City to induce the boys to remain in the manual training high school thruout the entire course. Many of

them have been stopping when about half way thru and going to work. Business and professional men of Kansas City, manufacturers, engineers, merchants, architects, engravers, and mechanics, are joining in an effort to make it clear to the boys that they are not well enough equipped for the life work until they have completed the entire course. The first talk of the series has been given by one of the leading architects in the city.

The city of Peoria, Ill., has taken steps leading toward continuation school work. Evening classes in mechanical drawing and mathematics have been opened under the direction of A. P. Laughlin, supervisor of manual training. This has been done in cooperation with a committee from the carpenters' and builders' association and meets the approval of the carpenters' union.

WESTERN STATES.

The school board of Denver, Colorado, has authorized the construction of a manual training building to be used in conjunction with the north side high school. In architectural design this will be in harmony with the north side school. It is expected to cost $50,000.

A plan for teaching agriculture and manual training in the rural schools under district supervision is being worked out by County Superintendent Busch of North Yakima, Washington. The plan provides for one teacher in each district who will teach agriculture and manual training in the consolidated schools in which will be laboratories and workshops. A good working library will be provided for these subjects. The buildings under construction for such consolidated schools are costing from $10,000 to $28,000 each.

The manual training and commercial high school of Oakland, California, is making an effort in common with many other California cities to secure a new building. It is proposed that bonds be voted to erect a new $600,000 building. The design for the new building has been prepared by Walter A. Tenney. It is intended to accommodate two thousand students.

Santa Monica, California, has just voted $200,000 for a polytechnic high school. Some of us living east of the Rockies could learn a lesson in school campaigning, and incidentally in public enthusiasm for education, by studying the literature passed out to the voters of Santa Monica just before election day. On one sheet 18x24 inches were printed the important facts bearing on the question, and a large illustration of the proposed site of the new school, extensive views of similar schools already erected or in process of erection at Hollywood, Monrovia, Long Beach and Riverside, and five large half-tones of present equipment for work in manual training, cooking and sewing.

HAWAII.

Industrial training forms an important part of the work of the public schools of Hawaii just as it does in the Phillippines. The course includes agriculture, woodwork, printing and domestic science. Pupils to the number of 9,309 in 125 schools have been engaged in systematic gardening. Two of the schools, including

a reformatory school, have raised sugar cane on a commercial basis, the 1911 crop being expected to yield over $5,000.

Twenty schools are equipped for carpentry work, and 7,575 pupils are engaged in that work during the year. Seven schools are equipped for printing and do regular printing on school work, publishing a paper and many other things. Domestic science includes cooking, sewing, lace-making and weaving. Twelve schools have cooking departments. In sewing 8,500 pupils have been engaged. Nearly all the schools teach plain sewing to both boys and girls of the primary grades, while the higher forms of work, such as cutting and fitting of garments, are taught only to the girls of the higher grades. Twenty-one schools give instruction in lace-making. Five hundred pupils have done weaving with grass, bamboo and hala leaves. —*New York Sun.*

ENGLAND.

A new system of central schools will be established by the London County Council to give an educational course not hitherto generally provided in either elementary or secondary schools. Generally speaking, the central schools will replace the existing higher elementary and higher grade schools; they will receive pupils at the age of eleven from surrounding contributing elementary schools, and will, as a rule, be carried on under the ordinary regulations of the board of education for elementary schools. Central schools will provide courses of instruction extending over four years; all girls will go thru an approved course of domestic economy, and all boys thru an approved course of manual instruction. It is expected that the curriculum will be framed with a view to the pupils leaving between the ages of fifteen and sixteen, that the courses of instruction will be organized to provide for the pupils the best possible equipment for entering the industrial or the commercial world as soon as they leave school, while at the same time qualifying them to commence some special course of technical training at a polytechnic or similar institution if they desire to continue their education further. The council intends that central schools shall give their pupils a definite bias towards some kind of industrial or commercial work, while ensuring that their intelligence shall be fully developed, and proposes that the schools shall be treated as schools of a non-local character.

Mr. Tryhorn, superintendent of manual training in Liverpool, has been appointed an inspector of manual training under the national board of education.

The Schoolmaster recently published the following excerpt from a letter written by Dr. C. M. Woodward of St. Louis: "I am amazed at the rapid growth of the sentiment in favor of a vocational trend to manual training, and yet I am very unwilling to favor a general adoption of a narrow instead of a broad system of training. Give a boy what will really be best for him, and let alone the interests of the employer who would exploit him to hew wood and draw water. I have heard men teachers declare that we must have an ignorant menial class, and hence we must not train all boys. That this is public policy I deny. My slogan was: Put the whole boy to school. It now is: Put every boy to school, and train head and hands together."

REVIEWS

The Boys' Book of Model Aeroplanes. By Francis A. Collins. The Century Company, New York, Oct. 1910; 7¾ x 5¼ in.; 52 illustrations, mostly full page photographs; 308 pages; price, $1.20.

Even if one has never thrilled to see an aviator soaring like a bird over the landscape, he can gain some idea of what that delightful sensation is from the first chapter of this fascinating book. To many a bright boy this book will prove an effective stimulus to try to make a toy aeroplane of his own, and so have the fun of an entirely new sport. Many of the illustrations (reduced in size) and some of the text appeared in three consecutive numbers of the St. Nicholas, and these have proven intensely interesting to the boy who likes to make things. Perhaps the newness of this sport accounts for the fact that the text and illustrations are almost wholly suggestive of what to do and how to do it rather than definite. There are no working drawings; but a working drawing might be useless because the successful flight of an aeroplane depends upon so many subtly varying conditions. The text makes one feel that in truth this is still an open field for invention. Consisting of two parts, the book first deals with "Models: How to Build and Fly Them;" and then of the "History and Science of Aviation," the later chapters reflecting some of the intense popular interest manifested in this new field.

One would like to see the plates numbered and referred to in the text consistently in Arabic notation rather than by three systems,—letters, Arabic notation, and Roman notation; also some photographs of the more recent notable flights described in the later chapters. HARRIS W. MOORE.

Design in Theory and Practice. By Ernest A. Batchelder, Pasadena, California. Published by the Macmillan Company, New York, 1910; 5¼x8 in.; pp. 268; 258 illustrations; price, $1.75 net.

In his preface the author states that it is the aim of this book to be helpful, not only to teachers and students, but to others who feel the lack of a standard to assist them in forming a judgment in questions of design.

The introductory chapter states the purpose of the study of design as being to stimulate the imagination, to develop original thought, to strengthen judgment and to acquire the power to express one's self in a clear and intelligent manner. The second chapter treats of utility, or adequate service, which in design is of the utmost importance. The historical development of the construction problem of lighting is then taken up and fully illustrated. The third chapter deals with the three elementary esthetic principles of rhythm, balance and harmony. Many illustrations are given to make their meaning clear. The necessity of good construction is then emphasized.

The chapter on "Materials" gives an interesting study of the art of primitive peoples. Chapter six is devoted to tools and processes. Medieval iron work is given as an interesting illustration of tool-wrought ornament. "Refinement of Proportion" is the title of the next chapter and may be summarized thus: There must be coordination of all of the parts to make a whole.

The chapter on "The Play Impulse" is very interesting and helps one to understand the work and character of the Medieval craftsman. "The Idea and Nature," chapter nine, teaches that we must have ideas before we go to nature. Nature furnishes merely the raw material, and not the finished design. In the author's treatment of "From the Parts to the Whole" and "From the Whole to the Parts," he suggests two directly opposite methods of approach in designing.

The concluding chapter shows the necessity of more art training for the craftsman and more craft work for the artist. In each chapter there are a number of problems given to be worked out by the student; these probelms are fully illustrated and are very comprehensible. The subject of design has been so thoroly covered, and so clearly stated in this book that it is sure to prove valuable for both students and teachers. —ADELAIDE MICKEL.

Vocational Education. By John M. Gillette. American Book Company, New York, 1910; 5 x 7½"; viii + 303 pp.

This book is the result of a number of years of study and investigation in connection with the author's course of lectures on history and social science. It will be welcomed by the student of education for its presentation of the question as to what education should do for society.

"The field of education contemplated is that of the elementary public schools. While the principles of social adjustment might very well govern all grades of educational effort, and while sometimes, in the course of discussing some phase of the general subject of training, the higher grades have been touched on, it must be borne in mind that only the schools below the secondary schools are explicitly involved."

The book is divided into three parts. Part I, The Educational Renaissance, discusses in three chapters The Vocational Movement and Concept, Some Accomplished Results, and The Reaction on Education and the School.

In Part II, Social Demands on Education, the sub-topics are: Society and the Individual, Democracy and Its Imperatives, Importance of the Economic Interest in Society and Its Significance for Education, Pathological Demands on Education, The Social End of Education and Other Ends, and State Education and Religion.

Part III is entitled Methods of Socialization, and the chapter headings are: Criterion of Socialization, Socialization of the Program of Studies, Socialization of Subjects, and Some Socialized Programs. The book is fully indexed.

—W. T. B.

Shop Mathematics. By Edward E. Holton. Published by The Taylor-Holden Company, Springfield, Mass., 1910; 7½x5 in.; 212 pages; price, $1.25, postpaid.

"Shop Mathematics" should more properly be called "Machine-Shop Mathematics," as it is confined to the practical problems arising in actual machine-shop practice. The problems are arranged under appropriate headings and fairly cover the field including mechanical powers, machines, horse power, boilers, etc.

Rules are given and illustrative examples are worked out, followed by problems to be worked by the pupil. No attempt is made to present mathematical theory upon which the rules are based, or the mathematical principles of computation. The work seems to be well done, tho here and there simpler methods of

computation might be presented. No attention is given to calculation errors, and often results are given to a degree of refinement that is not warranted by the accuracy of the measured data.

It is a valuable collection of problems for use by a class taking machine-shop work, but it is rather too technical to be used as a source of problems in classes in mathematics. —C. E. Comstock,
Bradley Polytechnic Institute.

Physics. By Charles R. Mann and George R. Twiss. Scott, Foresman & Co., Chicago, 1910, Revised edition; 7½ x 5 in.; pp. 424.

Considering the drudgery entailed in the study of elementary physics by the plan generally followed in text books, the new Mann & Twiss Physics, divided into two parts, first "Physics every child should know," and second, "Physics preparatory to advanced work," is worthy of most careful consideration by every teacher of the subject. —Albert W. Jamison.

Simple Woodwork for Junior Classes. By Robert Wootton, with preface by Dr. C. W. Kimmins, chief inspector of the educational department of the London County Council; 7½ x 10 in.; oblong; 51 pp., illustrated with perspective drawings and diagrams; price, 75c.

This book is another effort to demonstrate the practicability of construction work in wood in primary and lower grammar school grades. It follows the lines of "Learn by Doing" by J. H. Judd of Manchester, tho the problems do not carry the student so far in construction.

RECEIVED.

An Outline for the Manual Arts Course in the Richmond Public Schools. This outline, prepared by Fred B. Hagaman, director of manual arts in Richmond, Va., is arranged by weeks and is unusually complete in detail. It covers (a) drawing and primary manual training, (b) sewing, (c) cooking, (d) cardboard construction, (e) knifework, (f) benchwork in wood, and (g) outlines for high schools. It contains many working drawings of models. In all it is a book of 171 pages and is published by the school board of Richmond.

Bulletin No. 13. National Society for the Promotion of Industrial Eeducation. This bulletin, giving the proceedings of the Boston meeting, is in four parts, as follows: I. Trade Education for Girls; II. Apprenticeship and Corporation Schools; III. Part Time and Evening Schools; IV. The Social Significance of Industrial Education.

Report of Committee on Course of Study in the Manual Arts. This is the report of the committee of the Illinois Manual Arts Association that has been working for two years in formulating and revising courses of study for elementary and high schools. Price, 10 cents. A. C. Newell, secretary, Illinois State Normal University, Normal, Ill.

Iroquois Uses of Maize and Other Food Plants. By Arthur C. Parker, New York State Museum, Bulletin No. 144, Albany, N. Y. This bulletin is uniform in size and style with the other excellent bulletins issued by the New York State

Museum. It contains 119 pages of text interspersed with line cuts, and 30 full-page plates of half-tones. This is especially interesting to one who wants to know primitive methods of preparing corn or the practical use made of corn husks by the Indians.

The Effect of Keyways on the Strength of Shafts. By Herbert F. Moore, Engineering Experiment Station, Bulletin No. 42, University of Illinois, Urbana, Illinois.

How to Make a Wireless Set. Popular Mechanics Handbook. Price 25 cents. Popular Mechanics Co., Chicago. Tells how to make a set of apparatus for wireless telegraphy.

Arts-Crafts Lamps— How to Make Them. By John D. Adams. Popular Mechanics twenty-five cent hand book series. Published by the Popular Mechanics Co., Chicago. This book gives working drawings and working directions for sixteen different lamps and lanterns.

Proceedings of the Fourth Annual Meeting of the Association of Life Insurance Presidents. This contains eight addresses on the general topic, "Educational Forces in Life Insurance," one of which is by President Judson of the University of Chicago, who spoke on the subject "The Place of Vocational Training in a General College Course," and another by President James of the University of Illinois, whose subject was "Vocational Training and Its Future."

Philippine Hats. By Hugo H. Miller of the Philippine School of Commerce. Published by the Bureau of Education, Manila, 1910. Sixty pages of text and 21 pages of plates telling the story of the making of the several styles of hats for which the Philippine Islands are noted.

Addresses and Proceedings of the National Educational Association, 1910. Dr. Irwin Shepard, secretary, Winona, Minn. Price, $2.00. Contains all the addresses delivered at the Boston meeting in July, 1910.

New Jersey Training School for Feeble-Minded Boys and Girls. Vineland, New Jersey. A circular of information.

Elementary Syllabus on Manual Training. By Leon L. Winslow, Niagara Falls, New York.

North Bennet Street Industrial School, Boston, Massachusetts. Alvin E. Dodd, director. A most interesting report on the work of this now famous school where new methods in education are tested before their adoption by the public school system of Boston.

Manual Training in the Public Schools. By Louis C. Petersen. Bulletin published by the Southern Illinois State Normal University, Carbondale, Illinois. This is an illustrated pamphlet dealing with the manual training course in this school in considerable detail.

JOSEPH HENRY JUDD

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SCHOOL CRAFT AND THE EDUCATIONAL VALUE OF DOING WRONG.

JOSEPH HENRY JUDD.

THE sub-title of the paper appears to be so diametrically opposed to the accepted precepts of moral teaching that some preliminary explanation is necessary before any attempt is made to prove the assertion made that by wrong-doing a child is making definite educative progress.

We have been told for years past that the methods of teaching school-craft were far from sound, being more or less dogmatic, certainly stereotyped, and designed more for the benefit of the teacher than for the harmonious development of the children. And we have believed that drastic reforms were as necessary in our section of the work of the elementary schools as any unloading of the present curriculum defined by the code regulations.

Led thus to investigate, experiments have been made during the last five or six years on educational method, or, to be more definite, method in education. We have been deeply impressed with the enormous value of mistakes made by both teachers and scholars in working out problems having known results, in research work conducted on orthodox lines requiring memory work, as distinct from a knowledge of principles; and especially with the utter lack of appreciation accorded to the spontaneous outbursts of self-acquired knowledge born of the innate inquisitiveness of childhood, when the tension of coercive discipline was unknown and the inherent activities were given fair play.

These impressions have caused something approaching on revolution in our centers of instruction, have partially released from bondage and

manual drudgery over ten thousand alert laddies, opened up a brilliant and enchanting vista of unlimited extent and established a new era with possibilities for future good, which, so far as we are able to judge from results to hand year by year, will be of immense value. You will remember that Bacon advocated the building and endowment of a college for the discovery of new truths in order "to mix like a living spring with the stagnant water" which characterized the university teaching of his day. We have attempted to create a new atmosphere in our centers and have succeeded in energizing the stagnant air, which has put life and vigor into both teachers and children. The changes have been brought about entirely thru the study of errors, misjudgment and mistakes in theory, policy and application. We therefore feel justified in saying that true education is largely founded on the correction of errors by humanizing influences.

Man Adam received his first lesson from his Maker in the command: "Of every tree of the garden thou mayest freely eat; but of the tree of knowledge of good and evil thou shalt not eat of it; for in the day that thou eatest thereof thou shalt surely die;" but the educative value of that lesson was not appreciated until after the fall, until after the wrong had been done and punishment awarded. Even thus it is today. Does not Pestalozzi say "that education of some kind begins from the cradle," and do not modern workers in social reform assert that one of the chief causes of infantile mortality is the unpreparedness of the mother to undertake the duties incumbent on motherhood? Is it not a fact that in many instances the knowledge necessary for the upbringing of children is gained after mistakes—often irretrievable—have been made?

This is a glaring instance of wrong-doing which will ere long bring about reform in the education of our girls thru the enlightenment of the administrator who, without rhyme or reason, perpetuates the systems and methods of by-gone ages. They will have been educated by wrong-doing. We can therefore safely say that by doing wrong the whole world is becoming civilized, and at every step taken in correction valuable knowledge is being assimilated.

We are all conversant with the injunction, "Whatever thy hand findeth to do, do it with all thy might," but seldom do we fully realize the potency which the word "whatever" may have in determining the activities displayed by a child who is brought directly under the influences of evil minds. When we see this precept displayed on the wall of a schoolcraft room for the purpose of moral teaching, we are inclined to question the value of it, and similar quotations or paraphrases, which

may present to the children a double meaning or an adaptable interpretation capable of being used by them to justify an action which is an offense against the discipline of the school, thoughtless inactivity (lazyness, some may call it), or deliberate wantonness in destruction.

We all know the little fellow who fails to reach the high standard of his classmates, who, thru the constant showing up of his failures, ultimately becomes perfectly immune to such treatment—almost a law unto himself, and ready to assert with full justification that he is obeying the letter and law of the injunction when he deliberately smashes up his model. "He has done it with all his might," and cares not for the result; the innate animal spirit has been roused, the curb has snapped; he is once again a savage existing in an environment at that particular moment distasteful to himself and his childlike conception of right and wrong.

The student of psychology will in a case of this kind find a ready-made "subject" for experiment and become more or less enthusiastic in the application of the principles constituted and involved in such studies, whilst the ordinary matter-of-fact individual will as readily adopt and apply corrective measures more forcibly and probably "with all his might." In each case the individuals, the child, the psychologist and the ordinary person will have received a moiety of education from the source of doing wrong. Whichever way the child has been approached, he must of necessity have received some knowledge of corrective influences, either mentally or physically and mentally, whilst the correctors have each added to their experiences another case to illustrate and prove their arguments for and against the question of corporal punishment.

THE TEACHER'S RESPONSIBILITY.

Doing wrong is a very potent factor in the education of every child, and especially is this dictum true in reference to schoolcraft. The far greater portion of an *instructor's* time is devoted to correcting mistakes, either in the handling of tools, the laying out of the work, or the method of approach to effect a given solution of practical problems. It matters not what the *media* be that form the groundwork of the scheme, the principles involved are identical, but some offer greater advantages than others. As a rule the *media* which present to the worker the errors consequent on wrong-doing in the quickest time should be considered as the basis or rock foundation upon which a sound and reliable superstructure can afterward be built. In this division, commencing in

the infant school, we generally find some kind of plastic material adopted by general consent because such work embodies the principle of self-development and places the initiative faculty of children upon an educational basis with the specific idea of developing and increasing the powers of the child mind rather than to furnish it with knowledge entirely foreign to its conception.

The origin of the idea, no doubt, is due to the pie-making child-play of early days when untutored and untrammeled, the spontaneous growth of the power of imitation forces aside all others, and develops side by side with the physical growth of the child. But it is questionable if the "plastic" foundation thus formed has produced one sufficiently solid for the superstructure which must of necessity follow.

Whilst we admit that teaching must follow the growth of development and not that of dogmatic exposition, we contend that the incorrectness of the products of imitation resulting from the use of plastic materials in the early stages of school life, is apt to caûse a distorted idea of form, a knowledge of which is said to be an essential element in true education.

We are fully conversant with the methods by which children of very tender years are made—no other word adequately explains the *modus operandi*—to produce copies of flowers, fruit, vegetables, etc., with faithfulness worthy of any artist of mature years, even to the beautiful bloom of the plum and grape, the delicate coloring of the peach and apricot, and the fragrant perfume of the parma violet. That is a very common and typical case of schoolcraft where education is given thru wrong-doing, where morality is traversed and truth maligned in the interests of selfishness and effective results. The real teaching of form, the *sin qua non* of the plastic medium is in such cases utterly ignored for selfish ends; the ultimate value of the repetitional, slavishly irksome, and almost inhuman work necessary to attain these excellent results are never for one moment considered, nor would the wrong-doing be acknowledged, by the persons who thus interpret the paraphrase precepts: "Let not thy right hand know what thy left doeth," but "do it with all thy might."

Plastic material readily renders itself to a travesty of truth, and therefore the effect caused by its use as a medium of quick expression, should be counteracted by some other medium, which at once shows in manipulation a distinct and unmistakeable difference between right and wrong. For this purpose paper cannot be equalled and especially so if the two surfaces are of distinct color. This medium offers all the advantages which can accrue from maintained interest and creative instincts, it admits of constant and ever-changing development in scheme of work,

which will engage the whole attention of the child, whilst judgment is exercised and the value of truth for truth's sake is ever prominent.

I do not know of any schoolcraft which educates more thoroly, more conclusively and more simply by wrong-doing than paper folding in the junior, and surface development in cardboard in the senior, departments of an elementary school, or which offers the same advantages with such a minimum of cost. Each fold, each crease, each tear, each cut, wrongly made is proof positive of error in measurement, judgment or manipulative skill. Patience, perseverance, thoughtfulness are almost automatically impelled during the period of pause which follows the discovery of error, and the child apprehends the causes without the aid of a teacher almost as readily as if given full assistance. Education by doing wrong is an accomplished fact, and whilst the child is conscious of his failure, he will attempt to carry out the necessary correction before the error is detected by his teacher.

APPLICATION TO OLDER PUPILS.

It will be obvious that these remarks apply with equal force to the handwork of the senior school—that is to woodwork, metalwork, garment planning and cutting, but do not of necessity apply to such crafts as bead-stringing and woolwork, cane and willow work, rug-making, paper flower work, and pulp modeling, because inaccuracy of planning, manipulation, or design are more readily covered up, and therefore do not present such unmistakable proofs of wrong-doing; yet each and every one of these can be made a groundwork of self-effort and education. The impression given by some of them is as sound as any given by either paper, card, wood or metal, but the essentials of truth cannot be so clearly demonstrated with pliable and plastic as by more unyielding and refractory media.

It follows therefore that a scheme of work should begin with the simplest elements with which the child is familiar, a substance or medium with which he is in daily contact—sees, knows, and handles at every stage of growth, and proceed gradually step by step, coincident with his physical development thruout the whole period of school life, so that "to knowledge is added power," "to what he knows, the ability to turn it to account."

Within the last few years alterations have been made in teaching schoolcrafts, and, altho to a certain extent the alterations have been more or less experimental, the teachers rather than the children have had

to bear the burden of change. If we look backwards a few years to the time when we as a nation, without rhyme or reason, accepted the schoolcraft schemes of foreign nations, all and sundry, and introduced these direct into our schools, we cannot help feeling somewhat ashamed of the treatment we accorded to the children placed under our charge, when we forced results from almost babies, in emulation of the results we in our manhood had perforce to produce to satisfy our critics and examiners of our executive skill.

We were satisfied to accept the assurances of American, Swedish and German experts of technological schoolcrafts, that a systematic course involving the use of certain tools and equipments common to specific industries was absolutely necessary to secure muscular activity of the hand with the specific object of counteracting the effect produced by a more or less literary scheme of education in our primary schools. We obtained hand dexterity by certain obvious methods of procedure and produced the required and preconceived results for exhibition purposes, but we ignored completely the well-being of the child. The finished model, not the enlightned mind was the be-all and end-all of the systems imported. Thus we have today many costly and elaborate, more or less totally unnecessary, tool equipments which doubtless bar the way to reform in schoolcraft procedure and militate against purely educational schoolcraft which claims the child as the starting point of the scheme of instruction.

NEW IDEAS WIN RECOGNITION.

Altho there are yet many exponents of the old school of thought who fail to see the real significance of the self-effort and individual, expressional aim of the new constructional movement, we may fairly claim that our efforts have proved successful, and that our education has been materially increased thru the complete acknowledgment of our blind acquiescence in procedure and conventionalities which were totally unsuitable for the purpose for which they were adopted. We have undoubtedly proved the educational value of doing wrong.

Many expert minds are trying to evolve a scheme out of the present chaos which shall bring schoolcraft within the range of practical politics in order to insure its inclusion in the curricula of all schools. Before this is possible many cherished theories and ideals will have to be ruthlessly cast away as false, and many converts will have to be made. The old idea of elaborate tool equipments—the greatest stumbling block to general adoption—will have to be eliminated, and replaced by some more simple

means which will admit of ready adaptation to local needs in town and country schools, and be in complete sympathy with the needs and requirements of the children.

To break down entirely the vested interests will take time. It may require a noble leader of men to effectually marshall the forces and direct the battle, but "He who waits to have his task marked out shall die and leave his errand unfulfilled." The mechanical methods which the old system perpetuates disgust the children, deprive them of imagination—the very essence of child nature—fill their undeveloped minds with mere words without meaning and leave them capable of doing little, if anything, without help.

In the newer method we have attempted to look beyond these talk-and-listen ideas by seeking out the natural aptitudes of each child, stimulating the mental growth by encouragement, in order to develop all the best inherent powers of mind, instead of placing before him the ideas, feelings and knowledge of others for assimilation as best he can, and memorizing the platitudes and axioms of past ages without investigation or reason, making him entirely subservient to the desires and will of others with whom, in many instances, he has nothing in common, destroying his individuality and curbing his innate activities and buoyant energies, to the detriment of the future well-being of the nation of which he is a unit.

STUDYING THE CHILD'S POINT OF VIEW.

In making the experiments, we were led to discard conventional ideas and teaching aids, by giving well-merited praise of a piece of woodwork made by one of our boys, which was not accepted. Being curious to know why the remarks made were not appreciated, we asked the boy for an explanation and received this answer: *"Please, sir, I have only worked to the drawing which I copied and produced a model which was designed by someone else, and in which I have had no interest beyond doing what was required of me."* We well merited the rebuke; we had done wrong, and received from that boy a corrective lesson of far greater educative value than any we had received during our course of training. Deeper research work followed, in which children in all stages of mental capacity and culture entered very largely into the investigations in order to eradicate wrong methods and established new theories. Our investigations showed us clearly that even mentally defective children are active inquirers of a peculiar and interesting type, and that the "wanting to know" innate inquisitiveness of normal children is far more deserving of cultivation than repression.

In dealing with sub-normal children we became children again, using child language, simile and example in order to reach the dormant cells of "mind pulp" and to obtain response to our efforts. The crude products of this class, or the moral effects produced by the lessons, would have failed to convince the most enthusiastic partisan of the value of the work attempted, but we felt that if the proposals were to be of any help in bringing about any reform in methods, it was absolutely necessary that every detail should be readily adaptable to every possible phase of child culture. We created infection by being, or appearing to be, enthusiastic over the smallest success; we watched the listless look give way to eagerness, apathy to activity, and a keen desire to excell. The clumsy, irresponsible fingers became more pliant, responsive to new will power, for the children during these lessons were living in a new atmosphere and being energized thereby. The teachers were more or less appehensive of failure, but this unthought-of enthusiasm of these children over their own successes, the ecstacy of joy shown as each produced the results of his labors for our inspection, became infectious, and engendered hearty cooperation in making the new methods a complete success in these schools, until we can now with full confidence assert that under patient teaching and guidance, even children of weak intellect can give definite expression to preconceived ideas without undue mental or bodily effort and with a minimum of equipment and teaching aids. At opportune times careful observations were made of the chief delights of well-matured children, of the provisions made for their demands in the various bazaars and toy emporiums, of child life in city slums and country villages, and in hospital wards—where perhaps the deepest and most lasting impressions were obtained—to further test the proposals. We argued that toys had a fascination for children which few adults realize, and more especially those which in any way give some realistic movement, or are capable of giving effect to imagination, and that under a skilful teacher the making of these toys would create an intelligence unattainable by the original methods. Whilst we take care to direct and guide the self-efforts of the children on right lines to secure manipulative skill, we give full freedom and encouragement to develop latent talents of inventiveness; the teacher has to be ever on the alert, almost an encyclopedia of knowledge, in order to answer the many and varied questions which arise during the construction of these individual, expressional models, which serve to make the work deeply interesting to both teacher and child, and to give an element of real life to the instruction.

Constant activity is the surest way of getting a child to learn; impressions made by failure produce deeper thoughts, inspire new resolutions and energize will power. Mere words have no lasting effect; by his failures he gains a mastery over himself and thus unconsciously lays a foundation of sound judgment upon which he can build the superstructure of his life's work. He has proved that wrong-doing has been a potent factor in his education, and that he can and does appreciate the precepts which presented to his undeveloped mind a perplexity of thought and application.

It matters not in what direction we make investigation in proof of the statement, we find that experience is gained—that is, education is enhanced—thru our own errors or the mistakes of others; in every walk of life, professional, civil, or commercial, we take advantage of failures and increase our store of knowledge thereby.

There are in existence today examples of wrong-doing in some of our finest works of architecture, in projects of civil and mechanical engineers, on both land and sea, and in many other ways well known to all of us; but we venture to think that in no case are the examples more pronounced than in our system (or want of it) of national education. It is a most curious anomaly, yet a serious fact that the best type of education (if we imply by the word, generation of power, for the direct application to the duties of life) is reserved for subnormal and abnormal children. Those of you who are interested in, or engaged with, children in the schools established for those of weak or defective mental growth, or in institutions of correction—reformatories, homes for waifs and strays, and other such establishments—well know that the extraordinary results obtained in these places is largely, if not wholly, due to the humanizing rational and natural system adopted by the teachers in developing or reforming the instincts and impulses of the children placed under their charge. In the education, or reclamation, of such children almost entire freedom is given to the teachers to work on the lines of natural laws, systematizing impulses and processes evolving character out of spontaneous activities, giving individual attention to individual needs, asserting with kindly repression the animal spirit, and diagnosing with full confidence of success the many failures of contemporary schools for normal children.

We must remember that all knowledge of form, of things, of sounds gained by a babe prior to acquiring the power of speech is self-gained knowledge, and that afterwards much is similarly gained without the help of direct teaching; and further that by the process of education

adopted in our public elementary schools as a whole, this natural method —which is considered vital in the cases before mentioned—is often strangled in the efforts made by administrators to standardize both observation and phenomena. We are constantly making the children mere receivers of our own acquirements, our successes and failures. Should we not rather attempt to follow the lines of least resistance adopted in special schools, appealing to the finer instincts thru direct observation, treating the hand and eye as handmaids of the mind, as against the existing method of training the various senses in almost water-tight compartments having no connection whatever for a continuity of flow?

We are convinced that the humanizing methods of these special schools are productive of results which, when compared with those of our primary schools, cause the latter to sink into insignificance. If then we assume these advances possible with sub-normal children by the coeducation of heart, head, hand, what might we not assume possible if the whole system of elementary education was conducted on these lines? At present it is not the children who are of prime importance, —it is finance. "How much can we earn in grants from the Board of Education?" "How much will the proposals cost?" "How will it affect the taxes?" These are the questions which decide the issue. The unwritten answers are before us every day; the wrong-doing is perpetuated year in, year out, and the close of each school year adds almost countless numbers to the ranks of unemployed because during the period of life when each plastic mind was hungry for growth in accordance with natural laws, we and our colleagues have been compelled to work against our better natures in conforming to regulations which are in many cases diametrically opposed to the future well-being of the children.

In conclusion let me appeal to you my colleagues to help forward, by every means in your power, the movement which has for its guiding star the real education of the children in every phase of school work on rational lines and in strict conformity with nature's law, and with the full assurance that, when the appointed time draws near for each one to give an account of his or her stewardship, appreciation and reward will come with the words of the great Teacher, "Well done, thou good and faithful servant, thou hast worked with all thy might, enter now into rest and the joy of thy Lord."

A BOX KITE

WILL J. CRAIG.

The kite described in this article is one that has been worked out in the attempt to design a box kite that will fly easily and that will withstand ordinary jars and bumps on the ground during the experimental stage without breaking a corner stick or suffering other serious injury. This kite, with full working drawings, is presented as a solution of this problem that has "worked" to the entire satisfaction of the pupils in the manual training shop at Belvidere.

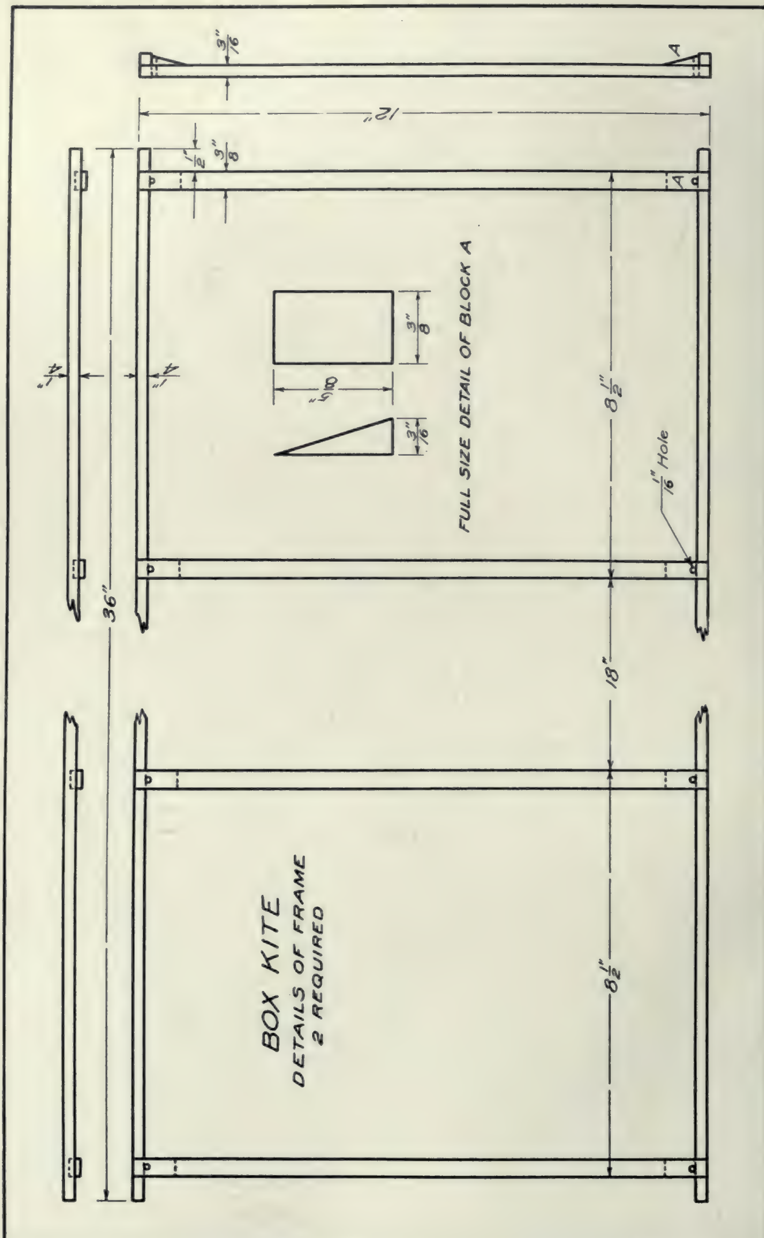
The materials required in the construction of a three-foot box kite are as follows:

Straight grained, soft, white pine,
- 4 corner sticks, ¼″ x ¼″ x 36″
- 8 struts, 3/16″ x ⅜″ x 12″
- 2 stretcher sticks, 5/16″ x 5/16″ x 48″

2¼ yards good quality cambric, any suitable color.
1 paper 2-oz. carpet tacks.
1 ball black wax, like that used by harness-makers.
Gilling, or carpet thread.
Medium laid seine twine. You can find nothing equal to this seine twine for flying line. No. 24 thread is the size we use for flying a three foot kite.

CONSTRUCTION

To make the frames, get out and dress up the four corner sticks and the eight struts to the dimension given. Place the corner sticks together on the bench so that ends are even and lay out with pencil and try-square the spaces for the struts on the four sticks at once. Now place two corner sticks on an old board, or on the floor, and tack each end of each strut in place with a small brad. Drive the brads in just far enough to fasten struts in place. Fasten both ends of one corner stick to board or floor, and with framing-square, square the frame and fasten the other corner stick down, after which the frame is ready for the glue. Loosen one of the struts from the corners, the brads remaining in the strut, put a drop of glue on each corner piece where the strut was, and place the strut back, the brad holes serving as guides, and drive the brads home.


BOX KITE
DETAILS OF FRAME
2 REQUIRED
FULL SIZE DETAIL OF BLOCK A
12"
36"
18"
8½"
8½"
1/16" Hole
3/16"
3/8"
1/2"
1/4"
5/8"
A

Do the same with the other three struts. Do not disturb until glue has time to set. Make the other frame the same way. While you are waiting for the glue to dry, get out sixteen of the brace blocks, A. Plane to size, saw to length, place block on sawing board, and cut the taper on one side with the chisel. One cut with the chisel should be sufficient to do the job.

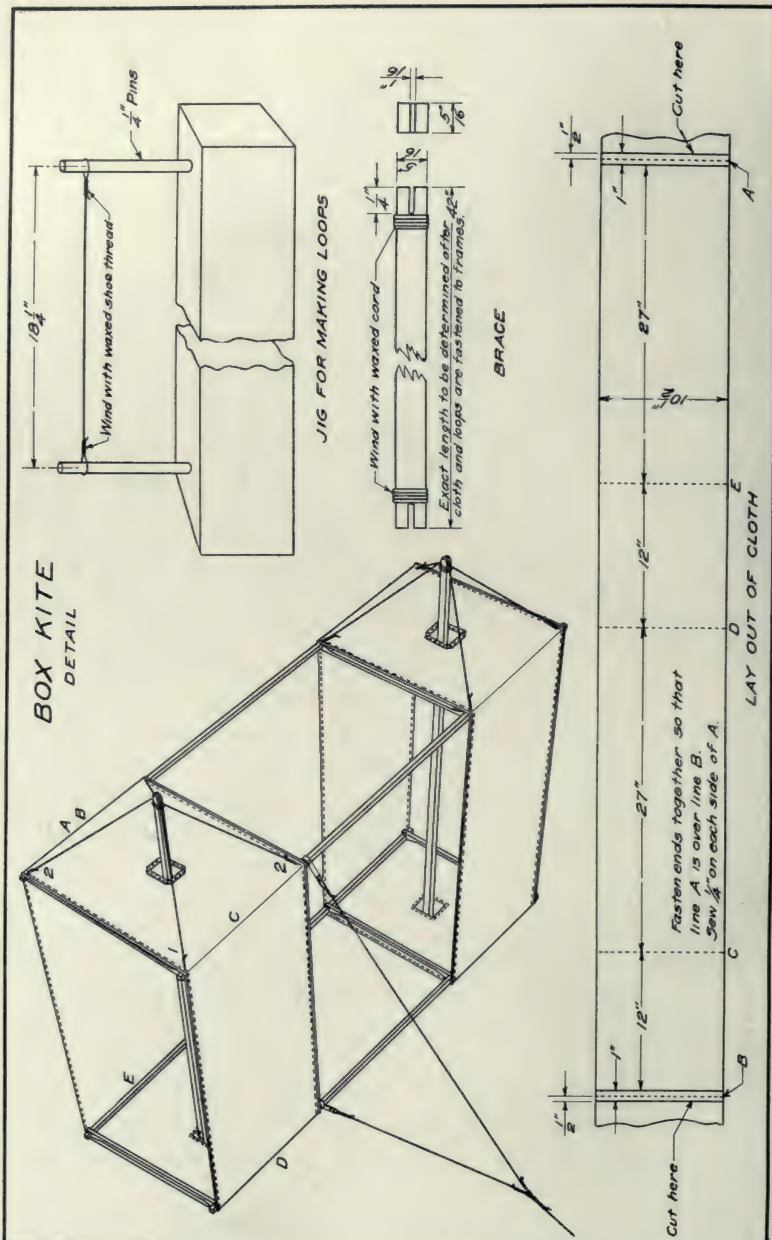
After the glue sets on the frames, remove them from the board or floor, turn them over and glue on the blocks; press them well in place and you will not need any clamp or nails. After the glue gets hard and dry, drill the $\frac{1}{16}''$ holes. Be careful to drill as close to the corner stick as you can, but without cutting it. The frames are now ready for the cloth. Get out the two stretcher sticks four feet long. Do not cut them to length until after cloth and loops are fastened in place.

To make the cloth cells, take $2\frac{1}{4}$ yards of cambric and tack or pin down on the floor so that it will be smooth and straight. With a framing-square, lay out from each edge and mark with a pencil the lines as shown in the drawing, to the dimensions given in layout of cloth. After the ends are sewed together, hem the cut edge, making a double hem, and if you sew a single hem on the selvedge edge it will add to the life of the kite.

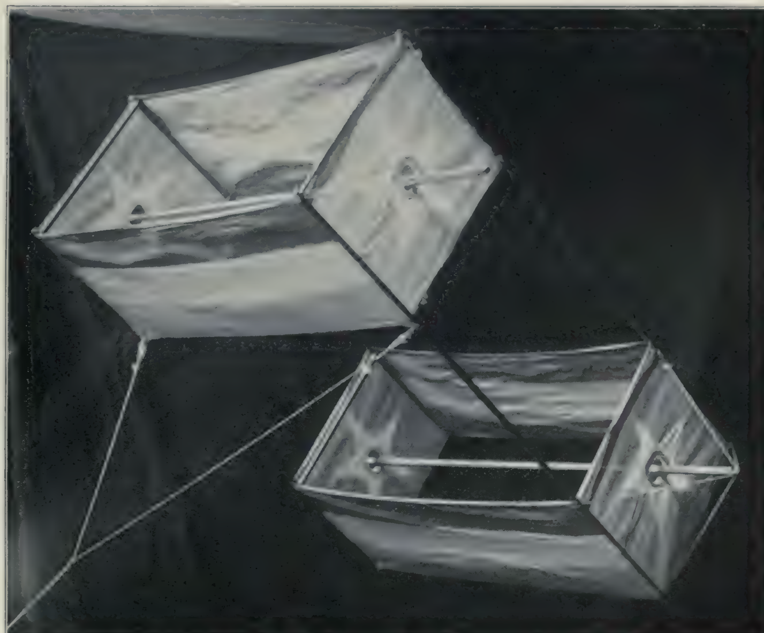
Next prepare eight loops of twine to stretch up the kite. Make a jig as shown in the sheet of details, and stretch a piece of seine twine around the pins; fasten by winding with gilling or carpet thread that has been well waxed with black wax. To wind, take a piece of thread about $16''$ long, place the center of it across the twine, $\frac{1}{4}''$ from the pin with one end in each hand, pass both ends down and under the twine, changing the ends to opposite hands, bring up and cross on top, pulling tight. Repeat this winding eight or ten times and tie. Treat the other end of the loop the same. Cut off all short ends, and remove from the pins. Make eight loops in this way, being careful to have all the same length.

ASSEMBLING THE KITE

To assemble: Place the frames (so that the struts will come on the inside) inside the cloth, with the dotted lines, A, B, C, D, and E, in layout of cloth and marked with pencil on the cloth, on the outside corners of frame; fasten to frame with one 2-oz. tack in each edge of cloth. Thread a large needle with gilling or carpet thread and wax it well with black wax; pass needle thru one end of loop, thru cloth, and


BOX KITE
DETAIL
A
B
2
2
C
1
E
D
1/4" Pins
18 1/4"
Wind with waxed shoe thread
JIG FOR MAKING LOOPS
1/16"
5/16"
1/4"
Wind with waxed cord
Exact length to be determined after cloth and loops are fastened to frames.
BRACE
Cut here
1/2"
1"
27"
10 1/4"
12"
Fasten ends together so that line A is over line B.
Sew 1/4" on each side of A.
LAY OUT OF CLOTH

thru the $\frac{1}{16}''$ hole drilled in strut, thence around the corner stick to the outside, and thru the loop and hole again. Tie the two ends and cut the thread. Fasten the other end of loop in the same way, but be sure to fasten it to the diagonally opposite corner, see sheet of details, 1, 1-2, 2. All loops are fastened in the same way.



A BOX KITE WITH IMPROVED FORM OF TENSION.

Sew two pieces of tape to the lower corner sticks just back of front cell, forming loops into which to fasten the flying bridle. The tape will not cut the corner stick when the kite pulls hard, which sometimes happens. One of these kites will pull from four to fifteen pounds according to the velocity of the wind.

Make a hole thru the cloth in the center of the end of each cell for the stretcher stick to pass thru. Notch one end of stretcher, see sheet of details. Stand kite on end with one frame next to you, pass the notched end of the stretcher stick under the loops, thru the hole, and on thru the other side of kite. Put the centers of the loops in the notch; grasp the

centers of the loops next to you and pull on them, at the same time pushing on the stretcher stick. Strain it up good and tight; mark stretcher stick where the loops cross, and draw it out; cut to length, cut the notch, wind with waxed thread, and put back with loops in notches on both ends. Fit the other stretcher stick in the same way.

FLYING THE KITE

To fly, stand the kite on end with the bridle end up and towards the wind; let out about fifty feet of line and run a little with it towards the wind. If you have followed directions carefully up to this point, the rest is easy and lots of fun. If the kite does not pull strong enough to suit you, set it up on end, get it squared exactly, and give the cloth a coat of thin shellac varnish. It will add to the life of the kite and increase its pulling power.

The frame of this kite can be made much lighter than the dimensions given and covered with silk instead of cambric. The writer has one that weighs only seven ounces, or one ounce for each foot of lifting surface, that will fly when there is not wind enough to keep other kites in the air.

GLEN FALLS, N. Y., HIGH SCHOOL.

METALWORK WITH INEXPENSIVE EQUIPMENT FOR THE GRAMMAR AND HIGH SCHOOLS, VII.[1]

ARTHUR F. PAYNE.

AT this particular stage in the development of this course, the problems that could be made, and the possible development of processes, are so numerous, that the writer feels loth to pass along without showing some of these possible problems and developments.

The crumb-tray and scraper shown in the photograph, are problems supplementary to the round plate, the same tools and processes being used. The metal is cut to shape, the edge lapped over, the design painted on and etched, and the depression beaten down over the edge of the wooden block, and planished and finished in the same way as the plate. The only difference is in the method of planishing the bottom of the tray and scraper: the straight front edge of the bottom must be planished first, crossing from one side to the other in regular even rows, planishing the deepest part of the depression last. The reason for this difference is that if the front edge is hammered last, it will stretch and swell upward and will not lie flat, thereby making it unsuitable for the use for which it is intended, which is after all the final test of any piece of arts and crafts work.

CRUMB-TRAY AND SCRAPER.

In this course we have used four decorative processes outside of coloring, namely, etching, saw-piercing, planishing with the neck hammer, fluting and modelling. The electric light dome shown in the photograph,

[1] Copyright, 1911, by Arthur F. Payne.

ONE SIDE OF "DOME" WITH DESIGN TRACED ON, AND ONE HALF "CHASED."

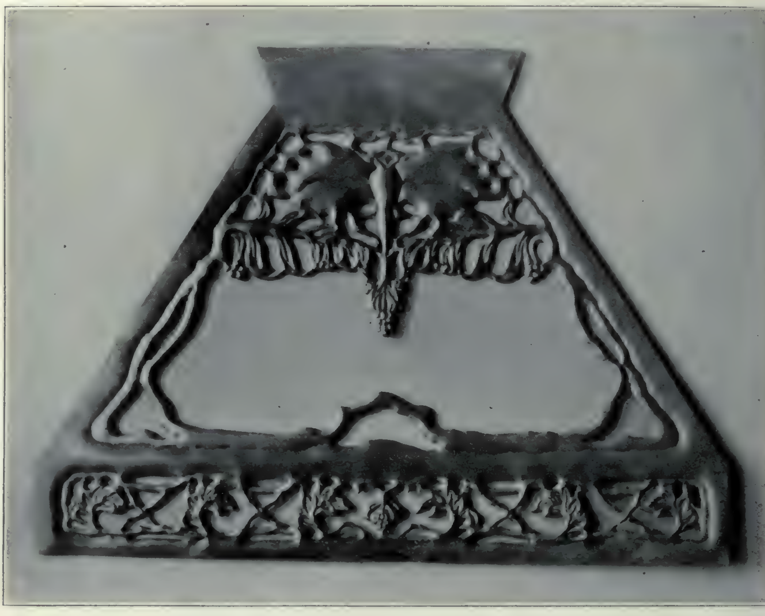
is a development of the lantern problem, and introduces a new process called "outline chasing," a process which is entirely suitable for public school work. The first photograph shows a piece of 20-gage copper tacked to a piece of one-inch board, with the design traced on one half and "chased" on the other half. This chasing, which is only the simplest kind of metal chasing, is done with two small chisel shaped tools that are called straight and curved tracers, and the ball pein hammer.

METHOD OF "CHASING."

They can easily be made from a piece of $\frac{3}{16}''$ square steel rod, and should be about $4\frac{1}{4}''$ long; one end should be filed to an edge like a small chisel, except not so sharp with the edge dull and slightly rounding, so as to avoid cutting thru the metal. The edge of the curved tracer is filed so that the curve would be about the same as a small section of a $\frac{3}{4}''$ circle. The tools and the correct position of holding and using them are shown in the photograph. It is rather difficult to follow the lines at first, so it would be advisable to practice a little on a scrap piece of copper tacked to the board. Do not make a very heavy

line the first time, but go over it a second and third time straightening and correcting it.

Another photograph shows the side of the dome chased, and the background cut out with a chisel, made and used in the same way as the chasing tools, except that it has a cutting edge which is kept sharp to cut thru the metal. After the chasing is done, and the background cut



SIDE OF "DOME" CHASED, AND BACKGROUND CUT OUT READY TO BEND INTO SHAPE.

out, the metal is removed from the board, cut and bent to shape, and riveted together into the finished dome which is shown in the photograph. The ceiling plate was raised into shape and planished, in a manner similar to that described for the lantern-top in the last issue.

Another adaption of this new process is shown in the sterling silver plate illustrated in the photograph. The same chasing tools were used as in the chasing of the dome, the steps in the process being: First, tack the flat piece of metal to the board by driving tacks thru the metal as near the edge as possible; Second, trace on the design; Third, chase the design; Fourth, remove from the board and trim the edge of the tack

FINISHED "DOME."

holes; Fifth, lap the edge; Sixth, beat down the depression; Seventh, planish and finish.

The next regular problem in our series, the small bowl, is distinctively a "raising" problem; that is, it is completed entirely by the process of raising from a single flat piece of metal.

CHASED SILVER PLATE.

There are three distinct methods of raising a shape from the flat metal, any one or all of which may be used, depending upon the shape of the object to be raised. The simplest and commonest method is that of forming the shape by beating it into a depression on a block of wood, or over the edge of a block, as in the cases of the match-holder base, lantern-top, and plate, already described.

The simplest form of the problem is the round pin-tray with a flat bottom, made from a circular piece of copper or brass about 4″ in diameter. This problem can be adapted to a variety of uses, with the same tools and methods as described, by varying slightly the processes. By using a circular piece of 20-gage sterling silver 8″ in diameter, we can

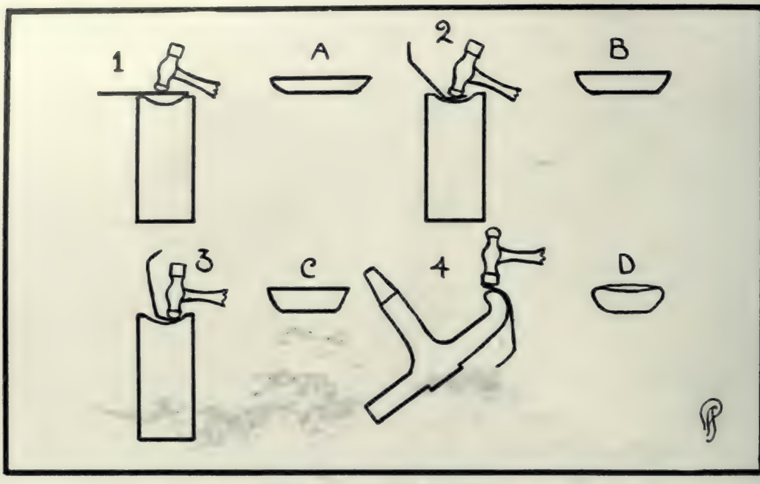
COPPER AND BRASS BOWLS.

make a dainty little salt disk. By using a piece of silver 5″ in diameter we have a dish for candies or almonds. By beating a 5″ piece of copper or brass as deep as the hammer will allow we can make a jar for violets or other short stemmed flowers. By inverting it and placing a glass ink well inside and tapping a bottom on, we have an ink-well that it is impossible to tip over. And by using an 8″ circle we can make a serviceable nut-bowl. All of these types are illustrated in the photographs.

For a description of tools and processes, we will take the round pin or ash-tray made from a circular piece of 10-gage copper or brass 4″ in diameter. We shall need a block of hard wood about 3″ square and 6″ long. Place this block upright in the vise and in one end cut with a gouge a circular concave depression, about 2″ in diameter and ½″ deep in the middle. If you cannot obtain a gouge, it is possible to hammer this depression in by striking the block with the ball end of the hammer.

With a pencil compass find the center of the piece of copper, and draw a circle the size you wish the bottom of the bowl to be. In a 4″ circle the bottom should be about 2″ in diameter, having one inch all around to

form the sides. Next place the flat piece of copper over the depression in the block and with the ball end of the hammer beat the copper down into the depression as shown in the photograph and in sketch 1. Strike



STEPS IN RAISING A BOWL.

a single row of blows all around the circle and this will raise the copper to the shape marked A in the sketch. Then tilt the bowl as shown in 2 and strike another row of blows with the hammer all around, about

PIN-TRAY AND INK-WELL.

half way between the first row and the edge of the metal; this will raise the bowl to a shape similar to B in the sketch. Now tilt the bowl as

shown in 3, and strike with the hammer another row of blows near the edge of the bowl, this will make the shape about the same as C in the sketch. Continue this process until it is fairly smooth and even and the shape you wish.

RAISING A BOWL.

The bowl may now be polished and planished and a simple design etched around the edge, on the inside on the bottom; or the shape may be made more interesting by beating over the edge as is shown in D in the sketch. This may easily be done by fastening the tee-stake[1] in the vise, in the position shown in the sketch, 4, and holding the edge down to the stake, bringing it to the shape shown at D. If the bowl is to be rather deep, the metal will probably become hard and unyielding. If it does so, anneal it and clean as described in the last issue and continue hammering, remembering to strike even, regular blows all around the bowl. If you strike harder on one side than on the other, the bowl will not be true and even in shape. The regular even hammer marks on hand-made metalwork, give to it a beauty and charm that is impossible to reproduce by any other means. A bowl that is uneven and has been chopped and banged at with a hammer, is just so much good metal spoiled, but one that is smooth and true showing the honest marks of the process used in bringing it to form, is an object of utility and beauty, something to take pride in, use, and treasure.

(*To be continued.*)

[1] See April, 1911, number, p. 374.

MANUAL TRAINING AND INDUSTRIAL EDUCATION IN PENNSYLVANIA.

Lewis W. Cruikshank.

THE Pennsylvania Frame of Government contained the injunction that all children should be taught some useful trade or skill, and from the very beginning there have been recorded feeble attempts to fulfill this law.

Manual labor schools and manual labor departments of colleges came into existence about 1830, coincident with the Manual Labor Movement which originated in America at about that time and which ran its course in a few years. The Manual Labor Academy of Germantown, established by a stock corporation in 1829, under a board of trustees, had connected with it a large farm and various workshops. In 1830 an agricultural school started on "Bottom Farm," near Bristol, Bucks County, under Ismar, pupil of Fellenburg, but this also had a short life.

A bill for the establishment of a state manual labor academy near Harrisburg, was reported from a committee of the House, in 1833. It was very strongly supported, but failed to pass. About the same time, Lafayette, Madison, Jefferson, Allegheny, and Penn Colleges, were trying the experiment of having students work part of the time on farms and part in the shops.

The common school law of Pennsylvania, 1834, Section 10, provided that it should be the duty of school directors to decide whether manual labor should be connected with moral and intellectual training, to be given in common schools, and if they decide in the affirmative, they shall have power to purchase materials and employ artisans for instruction of pupils in useful branches of mechanics. All of these efforts failed and there was no actual beginning of manual training in Pennsylvania until several years after the Russian Exhibit at Philadelphia in 1876 had stirred other sections of the country to action in the matter. True, the Franklin Institute, Girard College, Spring Garden Institute, and various colleges had been doing work of a semi-manual training character, but up to the late seventies no systematic method of teaching tool practices, had been introduced into the schools of Pennsylvania.

Philadelphia was the first to recognize the value of manual training as an educational factor. This was fitting, for the inspiration for this

movement in America had its birth in that city. Girard College first introduced work of true manual training character in 1872. The city took up the work in 1883 and started its first school in 1885. Homestead came next, Mr. Schwab giving the equipment for manual training in that city in 1888. Beside these two cities there remains only the city of Tidioute among the early ones. An equipment was given to this city in 1882.

The developments in the last few years have been of such character as to give new heart to many who were despairing of ever accomplishing anything in this slow old state.

CHRONOLOGICAL CHART SHOWING SEQUENCE OF EVENTS.

1830. Manual Labor Movement. Manual labor schools started and failed. Manual Labor Academy of Germantown, started and failed.
1850. Philadelphia School of Design for Women opened to the public. Avery Trade School for Negroes opened in Pittsburg.
1851. Spring Garden Institute opened lecture courses for artisans.
1871. Swarthmore College equipped shops for engineering students.
1876. Centennial Exposition at Philadelphia and great interest in manual training aroused by Russian exhibit of scheme of teaching tool processes.
Philadelphia Textile School opened thru influence of Exposition.
1878. Spring Garden Institute added a shop.
1882. Manual Training introduced into Tidioute schools by donation of a philanthropist of that town.
Girard College added first shops for teaching handwork.
1883. Commission appointed by the legislature to investigate and report on the subject of industrial education in the public schools.
Hebrew Trades School opened in Philadelphia.
1885. State College equipped with shops.
Central Manual Training High School opened in Philadelphia.
Commission made extensive report and recommendation to the legislature.
1887. Lehigh University equipped with shops.
1888. C. M. Schwab gave Manual Training Equipment to Homestead Schools.
1889. Institute for Colored Youths in Philadelphia started trade teaching.
Bowman Technical School for Watchmaking opened in Lancaster.
1890. Haverford College built shops.
1891. Williamson Free School of Mechanical Trades opened outside Philadelphia.
Drexel Institute opened in Philadelphia.
1895. Allegheny City installed manual training in some grades.
1897. Friends' Meeting School, Philadelphia, established manual training.
National Farm School opened.
1900. Roman Catholic High School, Philadelphia,
Yates School, Lancaster, and
Hill School, Pottstown, all started manual training.

1901. Wilkesbarre established manual training in schools.
Carnegie Technical Schools, Pittsburg, opened.
Berean Manual Training and Industrial School for Colored Youths and Girls opened in Philadelphia.

1902 to 1910. An average of two cities a year have established a little manual training work in their school systems during this time.

1906. Philadelphia Trades School opened.

1910. Thaddeus Stevens Industrial School opened at Lancaster.

COMMISSIONS.

Two commissions had served the state legislature of Pennsylvania whose work had vital concern with manual training and industrial education in the state. The first of these was appointed by the assembly of 1887 to investigate and report regarding the subject of industrial education. Five prominent educators served on this body, without pay except expenses, and made a diligent study of this subject in their own and other states and in foreign countries. One member spent several months in European countries and his report is incorporated in the complete final report of the commission.

The commission made the following recommendations to the state legislature:

1. That provision be made for the introduction of manual training into each state normal school, with a prescribed course in woodworking for all students, a course in iron work for young men and a course in sewing for young women. All work to be accompanied with a comprehensive course in drawing.
2. That an appropriation of $5,000 be made to each normal school for the establishment of the proper plant, including building, equipment, tools, etc., and a further sum of $2,000 annually for maintenance.
3. That after April, 1890, no certificate or diploma be granted a student of any state normal school, who shall not have completed a six weeks' course in woodwork.
4. That a summer school of manual training be started at State College.
5. That the state make moderate annual appropriations to such districts as shall undertake to start manual training in connection with their public school systems.
6. That provision be made for the introduction of drawing in every school in the state.
7. That the law require all new building plans to include rooms for manual training work.
8. That provision be made for the grouping of rural schools for the purpose of manual training.
9. That a state inspector of manual training be appointed.

10. That provision be made for the introduction of manual training into reformatories, but that no attempt be made to teach specific trades.

11. That under existing state laws manual training can be introduced into the schools.

This report was submitted to the legislature of 1889 and was considered at some length by that body, but was finally dropped as unsatisfactory and nothing further was done until 1907.

The legislature of 1907 appointed a commission to make thoro investigation of the entire public school system of the state and to submit to the assembly of 1909 a complete, revised, up-to-date school code. This commission, altho it did not attempt to make as thoro a report as that of 1889, brought before the legislative body in 1909, a very satisfactory and complete code, covering every possible phase of education in the state. That part of their recommendation which has to do with manual training is included in chapter XIX, section 1902, and reads as follows:

"The board of school directors of any school district of the second class in this commonwealth, when requested by 75 or more taxpayers, shall establish and equip a Manual Training School (Evening), for pupils over 14 years of age, provided that no such Evening Manual Training School shall be opened unless at least 25 pupils apply for admittance thereto, and the same shall be closed by the board of directors when the attendance falls below this number." This is absolutely the only provision of any kind for manual training or vocational schools in the state. It is significant of the attitude of this commission that no mention is made of manual training in our state normal schools. This the commission of 1889 provided for very amply.

However, it is not worth while finding fault with the school code of 1909, for it followed in the wake of its predecessors and went into the waste basket. Its crooked path thru the legislative halls of the capitol at Harrisburg are entirely in keeping with the reputation of this state. It was alleged that the book companies and the politicians of Philadelphia so changed the code as to make it worthless to the public and enabled themselves to borrow unlimited amounts of money for the city school system and to control the book supply for the state.

PRESENT AND FUTURE.

In the state at the present time there are a few trade and vocational schools, one or two of which are doing work of real value in training for future breadwinning and good citizenship. However, the manual training

high schools, such as are located in Philadelphia, Harrisburg, Scranton, and Altoona, are all tending, some unconsciously, some with declared intention, toward vocational training.

Among the manual training high schools, those of Philadelphia and Altoona are accomplishing the most good. In Philadelphia they are overcrowded and the percentage of boys remaining for the full four years is gratifying. In Altoona the high school was equipped by the Pennsylvania Railroad, and serves admirably as a training school for its future employes.

In cities like Chester, Allentown, York, Pittsburg, Easton, and Lancaster, in which there is no manual training or industrial training work, we note a spirit of unrest regarding this matter. Allentown and York are waiting for their new high schools in which to start work of this character. Easton has a committee on the road, making investigation with the idea of installing some of this work next year. Lancaster says that the matter has repeatedly been brought to the attention of the school board, but has, in each case, received a rebuff.

In Homestead we find a beautiful school, presented to the city by C. M. Schwab, but manned by inefficient teachers, as the city claims to be unable to maintain such a school.

As far as grade work is concerned, the progress of manual training has been poor indeed. Very few schools have any work below the fifth grade and it is surprising to find how few have any below the high school.

As a whole, the cities of Pennsylvania, in which manual training is conducted, do not want for comfortable quarters. In all cities in which the work is taught in high schools, there is provided either a fine new building, or very comfortable rooms. It is mostly in the grades and in old high school buildings that the work is relegated to cellars and old shacks. There are but two cities reporting the use of centers in localities and this is due in a large measure to the fact that few cities have any work in the grades.

The teacher presents the real problem in the success of this work, and in too many cases is the cause of its failure. In many of the cities they report that the work at first was under the direction of a first-class pedagog, but he was replaced by an artisan, as the artisan could be hired cheaper and knew the business as far as the practical end of it is concerned. This attitude of school boards is not improving with the years and is not helping the cause of manual training.

Ninety per cent. of the manual training work in Pennsylvania is in

wood only, and the systems followed are well known by the character of their product,—coat-hangers, toothbrush-racks, broom-racks, etc.

Some schools are producing excellent results with furniture making courses and others are losing out on the same thing because of poor administration of the department. In the grades we find stereotyped courses in well-known materials, such as sticklaying, cardboard, clay, etc., and there is little that may be called a departure. There is little enterprise shown and no attempt at a Fitchburg or Cincinnati plan.

About one-half of the private schools of the state conduct manual training work in connection with their schools and in many cases the work is of a half-hearted character. No colleges have started this work for its educative value in training the hand and eye together. Where shops are used, they are to give engineering students practical work illustrative of their profession.

From a state of lethargy to one of keen interest, is the transformation which has taken place in the past few years among the teachers of Pennsylvania. In the last two state conventions of teachers, a large part of the time has been given to the discussion of the "industrial education problem," as they elected to call it. I believe that I am safe in stating that two-thirds of the teachers of the state are heartily in accord with the work. All labor conventions of recent years have indorsed, and even offered assistance in, this movement for the training of hands as well as minds.

This has been, perhaps, the most difficult state in the Union, in which to educate the people to the value of hand training in their schools. Many of the letters in answer to mine of inquiry, have mentioned the stubborn resistance of the public, and I believe that the work could never have reached its present state without the support of broadminded philanthropists. In a number of cities the work done has been brought about by the efforts or money of some single citizen. Now, however, I believe that the general public is thoroly aroused to the value, need and possibilities of industrial education in the public school system of the state, and the only deterring obstacle seems to be the financing of the movement.

FIG. 13. A CRAFT CLUB—WORKING AFTER SCHOOL HOURS.

TWENTY-ONE YEARS OF MANUAL TRAINING.

JAMES PARTON HANEY

II.

THE preceding article described something of the philosophy devised as a foundation for New York City's work in the Arts, and something of the causes which brought this philosophy into being. With a vigorous imagination and a creed which preached the Arts as coordinate elements, one could conjure up a picture of satisfying completeness in which the new subjects were seen fully developed, fitted to each other and working smoothly in twice a hundred schools. But from such pleasant dream, one awoke with a cooled and chastened sense of the length of the road to be traveled before the vision could become reality. The plan was clear enough; there was at hand a corps of assistants to develop it, and with five thousand classrooms, one could not complain of lack of breadth in the field.

But it was this very breadth that made the new fledged director look so solemn. How could the theory of the Arts be made plain to so many, many teachers? None of these had been brought up to regard drawing as anything but drawing, or knew constructive work and design save as frills which in the one case used an abhorred material—clay—as part of the paraphernalia, and in the other, an equally ridiculous medium—water color!, "as if we were going to make artists of all the children!" And granted that one could corral these teachers in classes and conferences, and give them a new theory of the Arts, how were they to be given technical skill to enable them to make personal use

of it. Here was the rub—for the very first catch-word of the new creed was "Unity without Uniformity," and this required that all follow the same scheme, but follow it in plans suited to individual conditions and needs.

Plainly the case was one of "teach the teacher" and this implied a preliminary teaching of the supervisors who in the twenty-six big districts were to give this normal instruction on a rather abnormal scale. Under such circumstances, some school superintendents would have deluged the director with scores of cautions from the pedagogical "Don't Book." Not so did John Jasper, the long-time head of the schools of the city. He said no word until approached, and then as his forehead ran into a dozen humorous wrinkles and his eye twinkled behind his glasses, he remarked sententiously "be sure each teacher knows what she is to do, before she tries to do it—and remember—more flies are caught with honey than vinegar." How often have we recalled that brief and pregnant counsel?

The personal assistants to be trained, nearly thirty in all, made a sizeable group, but formed no Council of Perfection. Far from it, for it was soon plain to their anxious chief, that while there was a mass of material dealing with methods of teaching, there was no similar source of supply concerning methods of supervision, particularly of the highly specialized form of supervision demanded. The only literature touching the subject was buried in the proceedings of drawing teachers' associations, or to be read by implication in articles on school management. Even in the normal art schools, which fitted for supervision, there was but very scant attention paid to this side of the art teacher's training. In Kipling's phrase "the course was all to make," so almost before he realized it, the writer found himself presiding over a post-graduate normal school, with a term of a dozen years in prospect, and a practice department of several thousand classes. As the enthusiasm and devotion of his associates made that gathering what it was [and continued to be, for a decade and more], he may be pardoned the belief that it formed one of the most interesting "proving grounds" that the history of the arts has seen. Its members were all teachers of experience, chosen after searching tests, so it was not difficult to weld them into a single-minded body, embued with the communal spirit, and working in that impersonal way which must ever go with the successful doing of an extensive piece of work—the way which sees jealousy and self-seeking excluded, and the whole effort of the worker put into the service of "The Cause."

This "school of supervision"—as much a training class for its director as for his assistants—continued for a dozen years to hold what a pedagogically inclined friend termed "its hebdomadal gatherings." These weekly meetings were called "conferences," and were —what such meetings frequently are not—assemblies with frank discussions in which everyone took part, with the fervor that goes with the artistic temperament. An art school is said to be a place where students come together and teach one another, and in similar fashion these "supervisors' meetings" served as an Exchange and Clearing House for ideas. Programs were prepared, and three or four members were assigned each week to the presentation of phases of the work in hand—drawing, construction, or design. These exhibitions showed the choicest results secured by their exhibitors and served as a basis for explanations and lessons given to the group. Thus a practical ideal was kept continually in view, and every teacher brought to see how far her own work squared with the best her associates could show.

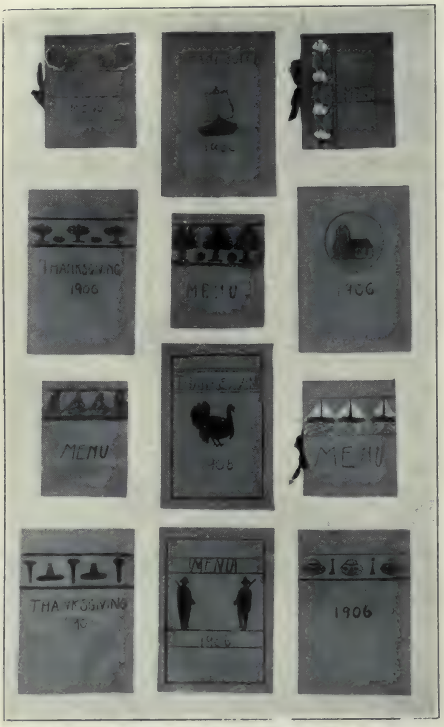


FIG. 14. WORK OF VARIOUS PRIMARY YEARS—THANKSGIVING DESIGN.

It would be difficult to overestimate the value of this personal contact and instruction in meetings where the very flower of the product of the schools passed in review. These gatherings formed the continuous sessions of an art teachers' associaton, which met to discuss practical problems of immediate concern to every member. Of them was born the feeling of professional pride and mutual responsibility, without which anything like unity of aim and method would have been impossible. Yet

the watchword was in mind, and the error avoided of making this "unity of aim" read " uniformity of method." The desire for unity was not, in other words, allowed to stand in the way of legitimate experiment, that better measures to make the arts "coordinate" might be devised. Indeed every step of the road was admittedly an experiment, and she whom George Ade would have capitalized as the "Earnest Pleader," after presenting a device for encouraging teacher or pupil to use the arts in some new and helpful fashion, was sure of an invitation to "try it." That the trial would be thoughtfully planned and carried out, goes without saying, when it is realized that the planner had later to present her results to a room-full of searching eyes and questioning tongues. This practice in clear-thinking and in simple and direct explanation meant much to the supervisor. It stood her in good stead when later she had to face in her own district meetings, scores of skeptical grade teachers who might have hailed as a body from Missouri could one have judged by the unanimity with which they required to be "shown."

FIG. 15. ILLUSTRATIVE DRAWING—THE CIRCUS —THIRD PRIMARY YEAR.

To the older teachers, the tentative efforts to fit and adjust the new course of study, were in both senses of the word—"a trial." They had been used to outlines fixed as a Median Law, and now saw changes in exercises with every successive term. As a rule they spoke more in sorrow than in anger, vainly regretting the good old days when one did this year exactly what one had done for a decade of years before. Occasionally a sharper protest in the public prints demanded—like the stern voice from the bleachers—"judgment!," as to whether the city's schools were "to be

turned by faddists into one great experiment station." But the younger generation, less accustomed to the case-hardened 'course,' soon entered into sympathy with the efforts to make the arts of service in their class work. They forgave the repeated adaptations in the light of what they saw was an honest effort to make the specialities not subjects for show, but helps in teaching, and aids in making the school a pleasant place to which to come and in which to work. As their interest grew keener, that of their older associates became more and more tolerant until there was finally heard in primary class rooms a most significant question. The plaint "are we never going back to the old course?" disappeared and in its place one was asked "can't I change this outline next term so as to work in Nature study?", or, "Language work?", or whatever had for that particular teacher a special interest. This was the flag of surrender hung from the battlements of the 3 R's. The citadel breached, the defenders were making overtures to these they once deemed enemies, but had come to see were friends.

Thru the requests and suggestions of class teachers there thus came to be incorporated into the arts course countless reflections of classroom needs. The grade-outline thereby profited immensely. Not only were the minds of a score and a half of district leaders focussed upon it, but many hundreds of teachers were interested helpers in suggesting ways and means to make the scheme more effective. To this end a growing body of shop teachers lent the practical views of the men behind the chisel and jack-plane. These helped much to temper the enthusiasms of the devotees of pencil and palette, so that from the joint efforts of many grew that which it is the part of this article to describe—the working-plan of the coordinate scheme of the arts.

This plan expanded as the working-philosophy behind it broadened and deepened. For its shortcomings the writer may fairly be held responsible, but for its virtues he would, in no mock-modest spirit utter a disclaimer. Credit for the latter must go to his associates and to that host of class teachers who made it. The printed outlines, or "syllabi," which were written in revised editions year after year, were the product of no one mind, but under constant emendation reflected the judgment of a great number of helpful but anonymous aids. Those who helped, however, understood that this aid was valued, and they shared in the spirit of team-work which was at the basis of the entire scheme. This spirit was preached in season and out. It appeared as one of the golden-texts in the

heart to heart talks of the director with his flock. Another was drawn from the sage commentary of Dr. Eliot on modern methods. Says he "We used to give little children tasks they could not do well. More wisely now we give them tasks they can do well, and show them how."

FIG. 16. CONSTRUCTION AND DESIGN—INDIAN CENTER—THIRD PRIMARY YEAR.

"Work together" and "show the way"—these were the beginnings of the code which slowly developed in the meetings of those who as directors of others sought to learn how to direct themselves. What follows is—as old Balloo would say—"the Law." A bulky chapter of commentary

might be written on each one of its provisions. For its makers it was supervision reduced to first principles—their judgment all compact.

THE SUPERVISOR'S DECALOG.

1. Aim to lead, not drive; enthusiasm and kindness will gain what force cannot secure.
2. Make system in doing, a habit; there can be no development without organization.
3. Study the general curriculum and develop the Arts as part of that curriculum.
4. Aim first to make plain the meaning of the Arts; to succeed they must be understood.
5. The Arts stand as means to ends—social, developmental, esthetic. Aim so to adapt them, that in every situation they may serve their purpose.
6. Teach most by objective example, by illustration and exhibition.
7. Keep before all teachers the highest standards raised by the children themselves.
8. Place teaching before criticism and make every criticism constructive.
9. Develop pride in an honest excellence, one born of methods founded on right aims.
10. Strive to know what makes for the professional life—and knowing—live it.

THE COURSE OF STUDY.

It has already been hinted that the new course looked to see all teachers teach the arts and all pupils learn them. It was the aim to make the grade instructor responsible for their success and to avoid multiplying specialists with their weekly irruptions into the classrooms of a school, their hurried lessons and their hurried departure. The specialists who were employed, therefore, did supervisory service and as little as possible inserted themselves between the class teacher and her pupils. The teacher, it was clearly seen, was the only one that knew the class and the grade work. Once she understood the idea of relating the "motor subjects" to this work, she was in a strategic position to make combinations that the specialist could never effect.

Frank disapproval was also aimed at the idea that only the elect could learn to draw. It is an axiom of the Arts that every pupil should receive their training. The dull they quicken, the bright they school in new methods of expression. They are emphatically not for the talented few, and the concentration of interest upon the gifted is one of the deadly sins in their teaching. This is peculiarly an error of the studio-trained

specialist in drawing and in painting, one ignorant that the arts do not exist to make artists but to quicken the manual and esthetic skill of all who come under their influence.

The idea of training the grade teacher to use the new subjects in personal fashion thus came to be seen as an essential part of the scheme. For before the planning of the details of the course had proceeded a half-dozen steps, the path came up against the rock-ribbed abutments of that structure known as the general curriculum. To organize the Arts as a coordinate part of this, required that the curriculum itself be founded on some scheme of correlation—but there was no foundation of this kind. There were numerous admonitions "to correlate," but no clearly defined strings around which such relations might crystallize. The culture epoch plan, tho not employed in the course of study, suggested a way out of the difficulty, and after a deal of experimentation, there was developed a plan of "center work," which proved to be the key to the solution of the whole problem.

FIG. 17. OBJECT AND ILLUSTRATIVE DRAWING—INDIAN CENTER—THIRD PRIMARY YEAR.

This center work was in the words of the White Knight "our own invention"—so far as it applied to the development of the Arts in the elementary schools. It became a leading feature in the coordinate plan and served to make that plan a working reality in a course of study that offered no other foothold for intimate relationship. It enabled the once feared specialties gradually to work their way from the outside into the middle of the primary curriculum and led many hundreds of teachers to use the Arts in connection with language work, number work and nature study around "centers of interest" particularly related to the needs

of their own small pupils. And—it may be added—what this plan did in making friends in our circle of schools it will do for all who choose to use it in similar situations. It is the password, grip and countersign, which will enable the supervisor laboring with "specialties" to call to his aid the instructors in the grades and make them willing assistants

FIG. 18. DESIGN FROM BOY'S CLASSES—SEVENTH AND EIGHTH YEARS—BOX-TOP, PLATE-, AND BOOK-RACKS.

in converting "specialties" into "essentials," gladly used because of the interest, pleasure and profit, they have for their users.

What this center plan was may be briefly described as follows: It pointed out certain topics in each of the different grades, round which it was suggested that the work of the class be developed for as long a time as the topic remained of interest. If possible, the language work, number work, etc., were to join in this treatment of the subjects, while the drawing, construction and design, were to serve in illustration of all the phases of it that it could be made objective thru the Arts. This use of the latter was what was meant in the direction to employ them "in the spirit of service"—to make them just as practically useful as possible. A page or two from a primary teacher's plan book will serve to show this plan at work in the classroom.

EXTRACT FROM A TEACHER'S PLAN BOOK. ONE WEEK'S WORK IN THE FIRST YEAR CENTER "HOME WORK."

LANGUAGE—
Conversations in
People in the Home
Home occupations
Mother's work
What we can do to help

ETHICS AND HYGIENE—
Lessons on
Helpfulness to elders
Kindness to brothers and sisters
Kindness to Animals.

NATURE STUDY—
House Pets
Canary, Cat, Dog.
Recognition and name.
Color, Movements, Covering, Food.

DRAWING—
Canary
Drawn in mass with colored chalk.
Illustrate
How I help mother.

CONSTRUCTION—
Things used in the homes
Broom—splint and paper.
Brush—splint and paper.

WRITING—
From copy in connection with Nature Study and conversations.
My bird is yellow.
I can sweep.
The baby sleeps.
My cat is black.

SPELLING—
Words used in conversation lessons
Bird, cage, bill, broom, baby, kitten, cup, dish, spoon.

NUMBER—
Combinations.
4 + 5, 5 + 1, 6 + 1, 4 + 2, 5 + 2, 6 + 2, 2 + 2.

STORIES—
4 cups and 2 cups.
6 birds and 2 birds.
5 apples and 2 apples.

A SECOND YEAR PLAN.

There follows another abstract from the plan book of a primary teacher in the second year, where the general center is Nature Study, developed thru a number of subordinate centers—the one illustrated being "seeds."

NUMBER—
Oral
Combinations 14 — 6.
Had 14 seeds in my hand, 6 blew away. How many had I left?
Special drills in increasing by decades the combination 6 + 9; 16 + 9; 26 + 9.

Written
Column addition
In a seed box I had 13 maple, 23 acorns, 18 apple, 82 milkweed. Total?
Problem in substraction
38 seeds, wind blew away 16. Left?

NATURE STUDY—
Disposal of seeds by the wind
Dandelion. Milkweed. Maple.
Spelling and Dictation
In connection with Nature Study
Seed, wind, wings, play, hair, stick, some, fields, blow, grow, sow, throw.
Dictation
This seed has little wings.
The wind likes to play with it.
The wind helps to sow the seed.
It blows them away.

READING—
Aim. Thought Expression.
Cyr's First Reader, page 48.
Blackboard lesson
The Chestnut.
Supplementary reading
Wilson's Nature Reader.
Tell part of story of The Maple Keys, write remainder on blackboard for the children to read.

DRAWING—
Milkweed pods
Colored chalk.
Aim
Good placing and individual expression.
Illustrate
Different ways in which seeds are planted. Emphasize proportion.
Construction
Fold pattern, cut and paste—seed box.

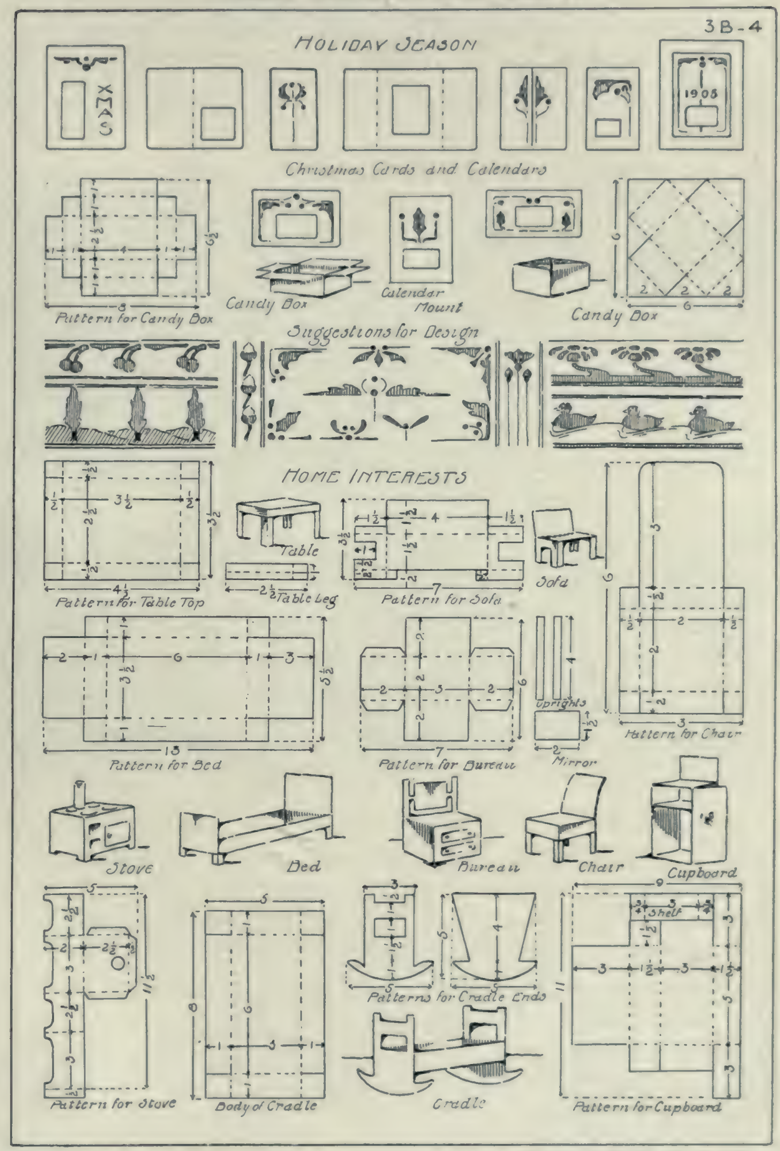
ENGLISH—
Oral reproduction
"How West Wind Helped the Dandelion"—Poulson.
Conversation
The disposal of seeds by animals and people.
Seeds that stick
Burdock, Stick tight, etc.
Disposal of seeds by animals
Acorns, Nuts—Squirrels.
Cherries, Apples—Birds.

POETRY AND WRITING—
Poetry
"Dainty Milkweed Babies."
Writing
Winds will blow away the seeds.
Some seeds have little hooks.
The hooks get into the hair of animals.
Milkweed seeds are brown.
The seeds have white wings.

The above excerpts give a little idea of what this individual planning served to accomplish. It made the work highly personal, and highly diversified. In time many scores of centers were developed. Some were useful only for a week or two. Some more elaborate, were carried by their makers thru a series of weeks. But all used the Arts as a matter of course and found them capitally helpful in aiding by pictures and constructions to clear up notions of number and form and color.

Naturally it was in the primary grades that the center work flourished best. The later years saw the curriculum more rigid and less adaptable. Yet even in the higher classes the idea of coordination was made to underlie the work in the Arts. Thus the craft work of the girls, with its embroidery, stenciling, block-printing, applique and bookbinding, and the shopwork of the boys of the same grades, was closely related to the needs of the school, and to the home. The different steps of each exercise

PRIMARY CONSTRUCTIVE WORK—GRADE 3 B



February 1906. Department of Education New York City.

FIG. 19. AN ILLUSTRATED PAGE FROM THE SYLLABUS FOR THE PRIMARY GRADES. IT SHOWS FORMS RELATED TO DIFFERENT CENTERS OF INTEREST. THE COMPLETE SYLLABUS CONTAINED MANY PAGES SIMILAR TO THIS AND INCLUDED OVER ONE THOUSAND SEPARATE DRAWINGS.

called for freehand and mechanical drawings and for knowledge of color and applied design. Each separate process was thus directed toward the same definite end. The study of science was also taken as a topic in the shops and much simple and ingenious apparatus added to classroom equipments.

FIG. 20. LEATHER WORK FROM A CRAFTS CLUB.

Not the least valuable result of this union of exercises was found in the interdependence of teachers which it occasioned. Where the grade teacher developed the working drawing for the shop model, and later, for certain forms, had her pupils devise schemes of color and simple decoration to be carved or stained there was a keen interest on the part of the shopman in the classroom lessons, and on the part of the class-teacher, in their shop development. The shop then became an intimate part of the school, and cooperation was made essential to any movement of the whole machinery.

But the reader will be prone to ask "How were the teachers schooled to a plan of such interdependence—what books did you use?" The second query may best be answered first. The books used were of our own devising, and, to add an Hibernian twist—they weren't books at all.

Of course, in a plan like the one outlined, none of the printed drawing books were of much service. All of these were full of denaturized exercises "in representation" or "in design"—planned to be used as well in one city as another. The coordinate scheme, however, demanded exer-

FIG. 21. A ROOM FURNISHED WITH PUPIL'S WORK.

cises fitted to particular plans for particular classes of a particular school.

It became necessary, therefore, to devise aids that offered general outlines with abundant illustrations, which the grade teachers might study and from which they might choose material suited to their purpose. On these lines were developed the leaflets known as "syllabi." Together they formed a manual of which now and then a few copies were bound, but which existed for the most part as a sheaf of pages of suggestions and pictures. Each syllabus was—like the other features of the plan—a growth. A more formal handbook or two was at first tried, but was outgrown and an aggravation before it had seen a term's use. Thus separate leaflets came to be recognized as the only practical way to commit the scheme to print. These had the advantages of a card catalog

FIG. 22. A TYPICAL SCHOOL WORKSHOP.

or a loose-leaf ledger. Each teacher received the outline for her grade, and as soon as improvements could be devised, it was withdrawn and a revised edition substituted without affecting the work or plans of other grades. In time there thus came to be a score of grade outlines, filled with over a thousand separate pictures, all bearing directly on the work in construction and design. Other pamphlets dealt with problems in mechanical drawing and shopwork, and also blossomed with many cuts as the value of these graphic hints became plain to the supervising corps. The latter discovered how wise was that old New England School Commissioner, who, on being told that the drawing teacher's outlines were always being lost, remarked, "Wal, if you'll fix 'em up with some good pictures, they'll val'y 'em too much to lose 'em."

Of course, outlines alone did not suffice to make the coordinate scheme plain. But they served as texts on which many conferences and lessons could be conducted. This form of district teaching was carried on as continuously as the supervisor's meetings. Indeed, Squeer's principle—that once you knew how to spell "winder," you were to go and clean it—found application in the continued admonition to carry the conference work over into the district meetings. Most of the latter were only big classes of teachers taught as the children were taught, by actual practice, and by exhibitions of work drawn directly from the classrooms. The best was shown that its standards might—as a leaven—raise the ideals of all who saw it.

In time another form of group teaching proved so effective that it deserves a word. A medical observer called it the "clinical method," but it was only the familiar form of "model lesson" conducted on a large scale. In it a class of pupils was carried thru the paces of some difficult lesson by a crack teacher, while the instructors from a hundred or more classrooms looked on. The presence of the pupils, their misunderstandings and mistakes, the reaction of the teacher to these, her appeals, illustrations and devices, all served to give a zest and point to the lesson that helped many an onlooker puzzled by just such difficulties. What a capital thing it would be if every good-sized town had just such a teaching amphitheater as one may find in a hospital clinic, a room where a hundred persons can be seated in steeply rising seats, while on the floor below them appears the complete equipment of a classroom. How many phases of teaching, not alone in the arts, but in English, history, geography, and science, could be illustrated to advantage with every move of

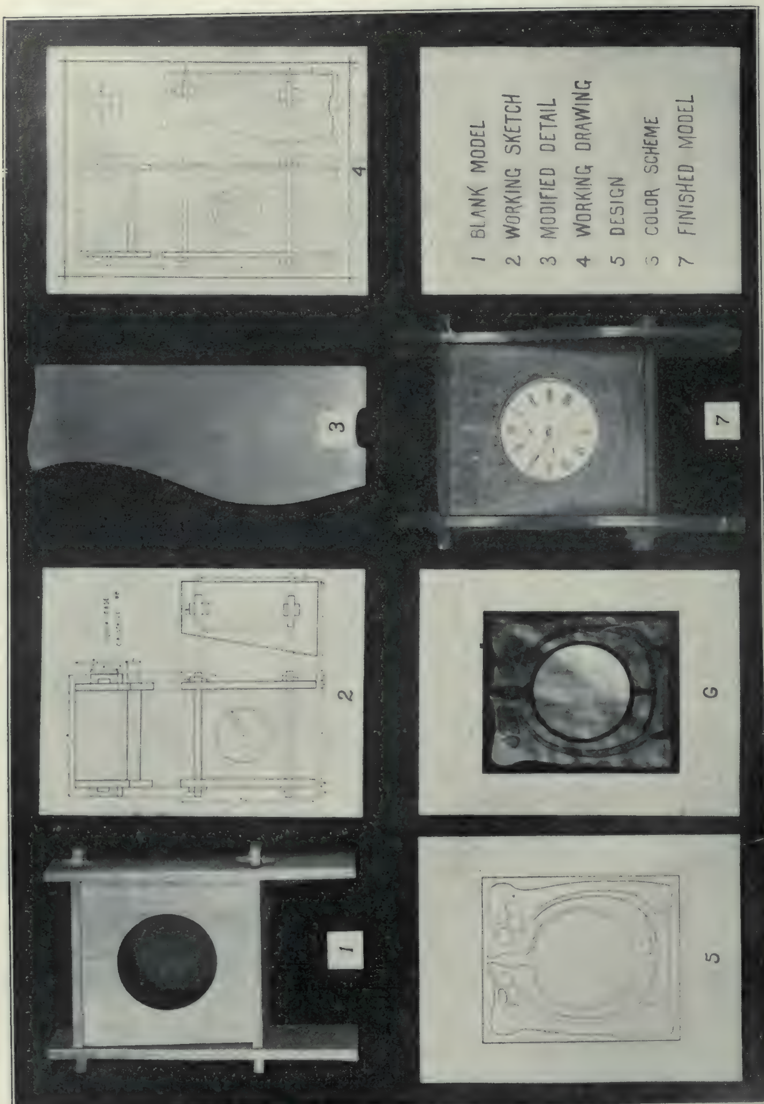


FIG. 23. AN ILLUSTRATION OF THE COORDINATE TEACHING OF WORKING DRAWING, CONSTRUCTION, AND APPLIED DESIGN.

teacher and pupils visible. Not a normal condition for a class to work in? Well, perhaps not, but the writer has seen teacher and taught under just such conditions, so wrapped in the subject of the lesson, that the quiet audience of onlookers might have been a dozen miles away, so far as their presence affected the teaching. But this idea is in parenthesis. Like Dr. Holmes' moral in the One Hoss Shay, "it runs at large—take it, you're welcome, no extra charge."

HOW THE SEPERATE ARTS DEVELOPED.

The story of how the separate arts developed would indeed make a long chapter, did one rehearse all the incidents in the march, with its halts and skirmishes, its temporary retreats and its victories in the winning of friends. Some of the more salient points must suffice, that the picture have sufficient of detail to make it clear.

It was early found that the illustrative or pictorial drawing of the primary grades was a self-registering barometer which showed the changes in the attitude of the class teachers toward the manual subjects. This drawing was a topic foreign to the course of study until the co-ordinate scheme appeared. It called for pictures made by the little folk which deal with their own experiences, home life, reading lessons, etc. Quaint enough were some of them, particularly in the lowest grade, when the policeman ran more to buttons than to arms, and the house appeared as that glass structure (in which so many of us live) which reveals its contents thru its walls. Quaint? Yes, altogether too quaint for many of the class teachers who could not be satisfied to have their small charges tell the story themselves. So there was first an effort to make the class tell the story the teacher's way—and Red Ridinghood crawled like a red bug thru forty similar forests of three trees, while a brown bug—the wicked wolf—ever pursued her. This wasn't youthful imagination in the process of cultivation. It was the old dictated drawing lesson not much disguised. So teachers were implored to give the children a chance—to let them tell the story their own way, with only the help of the teacher in getting over the technical stiles which cumbered the road. The next year or two saw an improvement—there was more child and less teacher; the pictures did not so plainly bear the hallmark of what one acid critic called "adultomania"—a passion for making the primary youngling do things in grown-up fashion.

Succeeding years saw more and more freedom in this work until, when the coordinate scheme was fairly established, one might find in certain classrooms, great collections of these illustrations done in bright crayons and fairly crammed with interesting, original and most graphic detail.

FIG. 24. TESTING A PIECE OF SHOP-MADE APPARATUS.

There rises in mind one such room in a school close-pressed by teeming tenements, where the walls glowed with dozens of virile pictures and were hung with scores of constructed forms in cardboard. These told the story of the coal mined in distant Pennsylvania and brought by train and barge to the huge black "pockets" that raised their somber bulk on the neighboring river bank. Here was "adaptation of subject matter to surroundings" and "interpretation of environment" in very cogent fashion; nor could one doubt the appeal of such teaching when one was personally conducted thru this picture gallery, by a cohort of original producers, all nearly suffocated with importance and information concerning the story they had learned. One felt truly as one looked and listened, that the leaven of the Arts was working—that here at least they were being used in the spirit of service.

As the illustrative drawing developed, so did the constructive work, which passed the first formal stage of cube and square prism, done in

oak-tag, and went on thru more elastic exercises (using paper, cardboard, splints, wire, string and raffia) until it too saw a genuine growth in original expression. This was made possible by "practice exercises" given to secure muscular control and technical knowledge, followed by the

FIG. 25. EXHIBITION OF SCIENCE MODELS MADE IN WORK-SHOPS—SEVENTH AND EIGHTH YEARS.

opportunity for original work in making forms based upon the practice model. In this latter work the illustrated leaflets aided much, as they offered many hundreds of forms related to many different interests in the home, the streets, markets, docks, railroad stations, etc.

The design done by these classes soon left the older drills on "Repetion," "Alteration" and "Radiation," and set itself to beautyfying these constructed forms—valentines, boxes, cornucopias, booklets—that were made by the thousand at every holiday time. Not only the patterns, but the motifs were changed and made for the child as real and appealing as possible. The dot and dash and stilted little borders of the drawing

books gave way to subjects drawn from the stories studied; so Cinderella's coach figured with pumpkin and mice in one set of patterns, and Hiawatha's tent, his canoe, and "the dark pine trees" in another. Thus the decorative work became of a piece with the construction and illustration. It rose from life and reflected living interests.

Thru all this, color ran like a golden thread. Its stimulus was directed upon each separate subject and the old hatchings and ellipses of dull pencil lines, were made to give way to the drawing of bright-hued toys, of beady-eyed dolls, and a whole menagerie of papier-maché animals. By degrees the entire primary scheme became tuned in the treble key. It showed the work of little children—recognizable as such—dominated only by the standards which children themselves could erect, filled with their love of movement, born of their interests in home and street, the Story of Indian, the Esquimaux and Jap, and expressing in over a thousand different classrooms something of their own power to make graphic and constructive the world in which they lived. The magic of the arts had shown how work—hard work—could be made as delightful as any play.

(*To be continued.*)

FIG. 26. FILING CABINET—GROUP WORK FROM EIGHTH YEAR PUPILS.

VISITING MANUAL TRAINING SCHOOLS IN EUROPE. IX.—MUNICH.

Charles A. Bennett.

FROM Strasburg I went to Mannheim, and in doing so I seemed to be going from poetry to prose. Mannheim is a modern commercial and manufacturing center. In the business part of the city, at least, the ground is level and most of the streets are laid out on the square. Except for the German language used in all the advertising in the store windows, one might almost think of it as an American city.

Unfortunately I did not receive my permit to visit the schools of Mannheim until I reached Paris, about a week later. However I was kindly received by Dr. Sickinger, the superintendent of schools, who allowed me to see one of the woodworking shops where there were no pupils at work and to study the display of models in the exhibition room in the central school building. Here I found clay work, cardboard work, woodwork, wood-carving and metalwork. Previous to visiting Mannheim I had seen the published course in wood-carving, *Neuer Lahrgang fur Schnitzen,* by Enderlin, and the course in metalworking, *Skizzen fur Metallarbeiten,* by Schaber. The influence of both of these books was evident in the models I saw, tho neither of their courses was followed in every respect. The outline carving of Enderlin was preceded by models adorned with chip-carving. The cardboard work at Mannheim was similar to that given at Leipsic, the woodworking course consisted of useful models simple in construction, and the clay work was essentially a course in hand-built and decorated pottery. In the Mannheim schools modeling and cardboard work may be begun by children nine years of age, but carving, woodworking and metalwork cannot be taken until the pupil is twelve years of age. Each pupil chooses the course he wishes to take. He may spend five years in modeling, if he wishes to do so, or five in cardboard work, or he may spend three of these years in carving or two in either woodworking or metalworking.

I called on Herr Fäber, the supervisor of manual training, in his home and from him obtained the following statistics concerning the development of his department:

Year.	Pupils.	Courses.	Teachers.	Workroom.
1895 to 1899	80	4	2	2
1899	345	20	5	5
1900	415	24	6	5
1901	584	30	8	5
1902	742	39	10	7
1903	920	43	15	8
1904	1134	57	20	9
1905	1280	60	20	9
1906	1573	73	27	11
1907	2167	110	45	17
1908	2731	140	50	24

Cardboard work was introduced in 1895, woodworking in 1899, metalworking in 1902, modeling and wood-carving in 1904. The distribution of pupils in 1908 was as follows:

Subject.	First Semester.	Second Semester.
Modeling	711	618
Cardboard work	804	704
Wood-carving	805	738
Metalworking	207	195
Woodworking	204	189
	2731	2444

Of all the boys in the public schools of Mannheim who were eligible to take manual training 41.47 per cent took the work in 1908. This is an excellent record for a German city. In many it is no more than from four to ten per cent. The supervisor stated that he believed that in two or three years the manual training would be a required subject.

The cost of instruction was only $5,250. Pupils paid a tuition of fifty cents a semester which covered the cost of the materials. About 700 pupils were admitted free because unable to pay the tuition fee. New equipment is not counted in the above figures because it is paid for out of the general equipment fund for the schools.

As I had no official permit to visit schools in Mannheim, and as there was a rigid rule against taking photographs even of work on exhibition, I remained only one day, and took the evening train for Munich.

On the following day I found my way to the *Rathaus* which, more than any other modern Gothic building I had seen, seemed to possess the charm of the medieval period. In this building was the office of the superintendent of schools, and there I presented my credentials to Dr. George Kerchensteiner, the man who has made Munich famous as a center for industrial education. He received me so cordially that I shall never cease to be grateful to him. In the twenty minutes I was in his office he conversed with me in English on educational topics of mutual interest, inquired for several American friends, told me just what I ought to see in Munich, planned my route, gave me letters and cards of introduction and a book outlining the courses in manual training in the city. Dr. Kerchensteiner especially advised me to visit the *Flurstrasse Volkschule* because it represents the latest development in his scheme of training for citizenship, and shows clearly the place he would give to art and manual training in the elementary school.

FIG. 127. FLURSTRASSE SCHOOL, MUNICH.

THE FLURSTRASSE VOLKSCHULE.

At eight o'clock on the following morning we started for this school. When we reached there a light snow was falling, but it did not prevent me from getting a snap-shot of the building, Fig. 127, constructed in the style of the old Bavarian builders. I was told that in an effort to revive the old Bavarian architecture, this style was being used in all the new public school buildings.

On arrival we were welcomed by the principal of the school, Herr Heinrich Eber, who conducted us thru the building and answered our numerous questions. First we went to the cooking room, Fig. 128. In harmony with the Bavarian style, the woodwork was painted instead of being finished to show the grain of the wood. The case at the end of the room, as I remember it, was painted a very strong blue and decorated

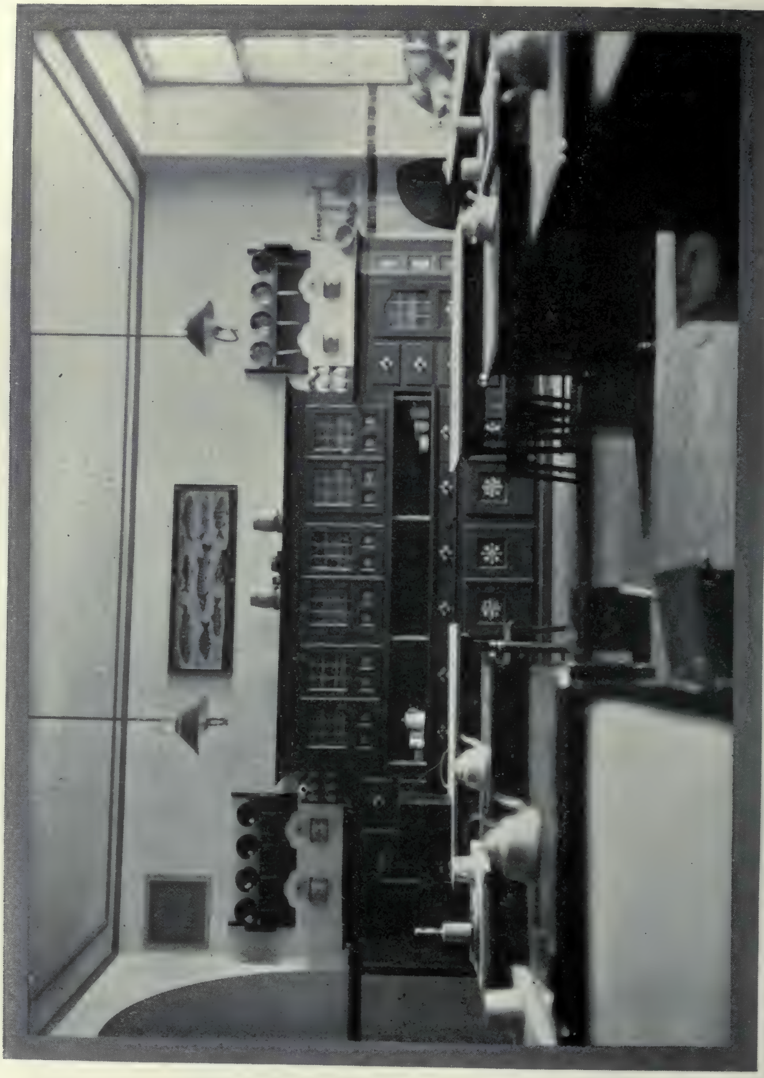


FIG. 128. COOKING ROOM, FLURSTRASSE SCHOOL, MUNICH.

FIG. 129. COOKING ROOM, FLURSTRASSE SCHOOL, MUNICH.

FIG. 130. WOODWORKING ROOM, FLURSTRASSE SCHOOL, MUNICH.

FIG. 131. TOOL CABINETS, WOODWORKING ROOM, FLURSTRASSE SCHOOL, MUNICH.

with white ornaments in the panels and around the drawer pulls. In this room were four large tables, each intended for six pupils. All the cooking work was carried on in groups of six pupils each, working together as a family. They cooperated in planning meals, in buying mate-

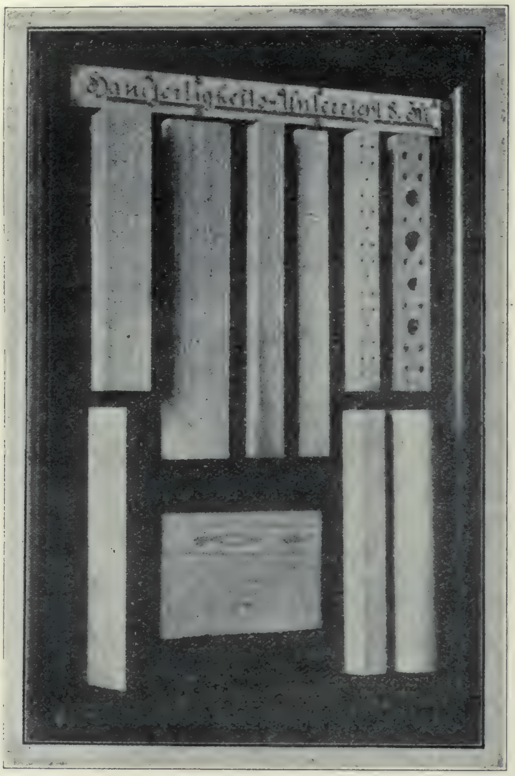


FIG. 132. FIRST PART OF EIGHTH GRADE COURSE IN WOODWORKING, MUNICH.

rials, in cooking and in cleaning. Fig. 129 shows the other end of the same room. On the blackboard is a list of materials with which to provide a meal for twelve people. The cost is equivalent to seventeen cents in American money. A stool is provided for each girl, but this fact does not mean that the pupils are given all their instruction in cooking in this room. The theory work, including chemistry and hygiene, is given in the regular classroom, or in the room especially equipped for chemistry.

The woodworking department was admirably equipped. There were individual benches, Fig. 130, tool cabinets hung on the wall between windows and on the two posts in the room, lights for evening work, a large stock rack, a work case, a turning lathe, drawing boards, a large

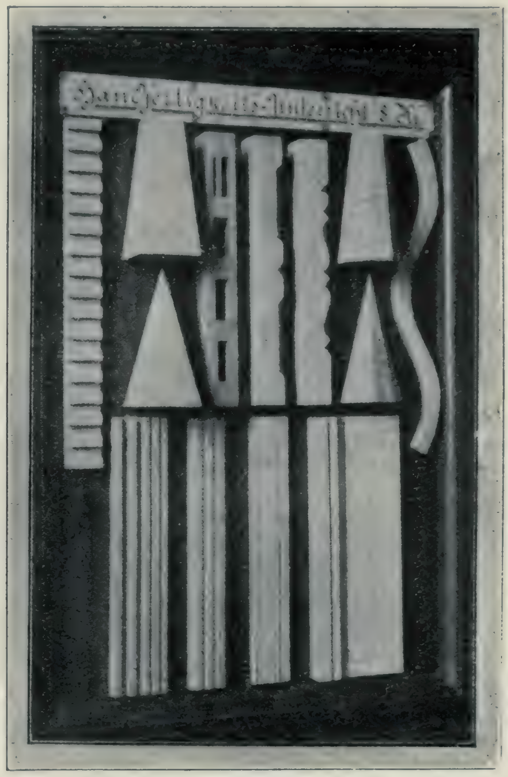


FIG. 133. SECOND PART OF EIGHTH GRADE COURSE IN WOODWORKING, MUNICH.

office for the teacher with desk and cases for displaying work, a lumber room, a wash-room alcove with four basins, and a museum room with shelving around it on which were arranged classified specimens of different kinds of wood. Fig. 131 shows two of the tool cabinets, one closed and one open revealing the set of tools.

The course of instruction in woodworking in all the Munich schools is highly technical in character. It consists of exercise pieces of rather

large dimensions. In fact it is just as "abstract" and severe as the original Russian course exhibited in this country in 1876. Figs. 132 and 133, reproduced from rather indistrict half-tones, suggest the forms and proportions of the models and the order in which they are given. In discussing these formal exercises the principal said that it was necessary to follow this course instead of useful models because this work was credited in the *Gewerbschule.* This eighth-grade course and the elementary course in the *Gewerbschule* must therefore be identical. He would not admit that there could be anything better for boys of grammar school age tho a chance interview with one of the teachers who was in the room brought out the fact that at least two useful models had just been planned for an ungraded class of backward pupils,—"blockheads," the principal called them, speaking in English,—who were to take shopwork without reference to the *Gewerbschule.* These models were a picture-frame with miter joints and a well designed key-board. The models were said to be easier than the regular exercises. I did not learn whether they were also more interesting to the boys. Personally I was glad to learn that these "blockheads" were to make some useful things, and I wondered whether the experience with this new class might not raise a question concerning the necessity of holding so tenaciously to the *Gewerbschule* course. Later I learned that representatives of the industries of Munich had expressed themselves as being opposed to the Leipsic system in which finished objects of utility are made, and that they approved of the system of exercise pieces. However, objects of utility are sometimes given by the teachers in Munich, but as extra problems for the especially diligent or skilful pupils.

A further and essential difference between the Munich and Leipsic systems is in the fact that Munich employs only tradesmen as teachers, whereas most of the teachers trained at Leipsic are regular grammar grade teachers who have taken one or more summer terms in the training school. The selection and training of the Munich teachers is, therefore, of special interest. Applicants for teaching positions must show knowledge of freehand and projection drawing, practical shopwork, shop mathematics, and of shop materials and processes. The candidates are given tests, and those who prove most efficient are allowed to do practice teaching for one year without pay, during which time they are required to pursue courses in drawing and the technology of the subject to be taught, to work out all the problems of the eighth grade course in drawing and shopwork, and to complete certain prescribed courses in peda-

gogy. After another examination the applicant may receive his appointment as a teacher, and finally, after a very thoro further examination in all the subjects of instruction, his appointment may be made permanent.

The salaries range as follows:

Year of Service.	Salary.
First to third	$525.00
Fourth to sixth	585.00
Seventh to ninth	645.00
Tenth to twelfth	682.50
Thirteenth to fifteenth	720.00
Sixteenth to twentieth	757.50
Twenty-first to twenty-fifth	795.00
Twenty-sixth to thirtieth	832.50
Thirty-first to thirty-fifth	870.00

The teachers are required to give instruction thirty hours a week. Only sixteen pupils are taught at one time. A class of thirty-two is divided into two sections and one of forty-eight into three. The instruction in shopwork is overseen by a head teacher of woodworking and a head teacher of metalworking. These head teachers are given the title of inspector of workshops.

FIG. 134. BOWLS OF STEEL.

My visit to the metalworking shop was just at the end of the hour, so I did not see the pupils at work. They had evidently placed their tools in order and were consulting their teacher concerning their notebooks. These books are a feature of the shopwork in both wood and metal. The books contain a drawing of each piece, its dimensions, the value of the material used, the time spent in the work, and the value of

the finished piece. The course of instruction includes filing, cutting with snips, twisting, bending, fitting, punching, riveting, raising, and simple construction work. I was particularly impressed with some bowls, Fig. 134, which had been beaten up out of sheet steel. They were excellent in every way.

The equipment was ample. Besides the four benches shown in Fig. 135, there was a long bench in front of the windows. Charts and good illustrative material were provided. In the teacher's office adjoining were two large cases with glass doors, which, added to the two shown in Fig. 135, gave ample space for the keeping of tools, unfinished work and models in an orderly manner. It was evident that the teacher was skilled in art metalwork for in his office I saw several pieces of his own handiwork, especially in iron, which were excellent in both design and workmanship.

The work in freehand drawing held my attention for a long time. Beginning in the fall the pupils study the fruits of shrubs. First a sheet of the elements, Fig. 136, is drawn and filled in with the brush in solid opaque colors. The barberries were vermilion, the rose seedpods were red, leaves were green, etc., and the colors were good. A noticeable thing about the drawings was that the berries were merely blocked in with straight lines, the rose leaves showed no serrations, and space was left in the color to show the veins. In a curled leaf attention was given to the curve. Drill in technique and preparation for design were evidently foremost in the teacher's mind, but the method of thought was that of discovery of the characteristic forms and beauties of nature.

After this sheet of individual studies of fruit in different positions and varying sizes together with leaves, growth of stems, etc., a full spray was drawn in the same manner on another sheet, Fig. 137. Every sheet was different from every other because each was drawn from the pupil's individual spray which he had gathered or bought in the market; every boy must provide his own model. In the rendering of this spray, also, the blocking in method prevailed, and the pupils were very successful in getting the leading characteristics of the spray as a whole, as well as of its several parts.

After a study of four or five different types of plants in this way, border designs, Fig. 138, were made, adapting the forms previously drawn to present needs, but the natural colors were not retained. These were varied, often reduced one-half or more in intensity and harmonized. After the borders, diaper patterns were designed. The directness and

FIG. 135. METALWORKING ROOM, FLURSTRASSE SCHOOL, MUNICH

general excellence of the work appealed to me very much. Everything had been thoughtfully done. Plenty of time had been allowed in which to acquire skill in blocking-in, and not one of the sheets looked as tho

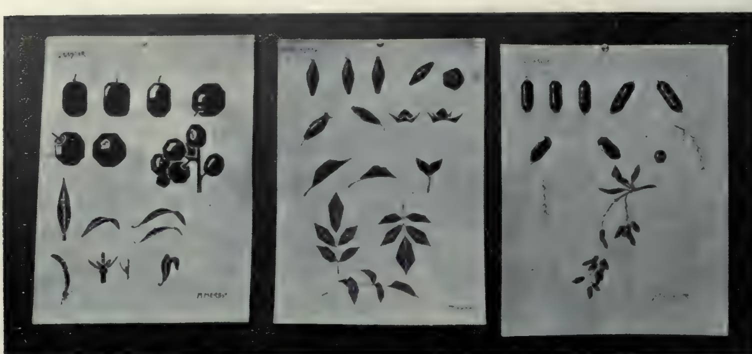


FIG. 136. STUDY OF FRUITS AND LEAVES.

it had been done by a careless boy. I could not help but make comparisons with some eighth grade work I had seen in America—hurried, careless, indefinite in method and leading to nowhere. To be sure this

FIG. 137. STUDY OF SPRAYS.

work in Munich was taught by a teacher who had skill, but should not that be true in America also? The teacher was a man who had been trained in a normal school—having spent six years in study above the

grammar school work—and in addition to all this, had taken courses at the art school, but he was what we call a regular grade teacher because he taught mathematics, reading, gymnastics, etc. in addition to the drawing. About half of the teachers in this school were men. The room in which

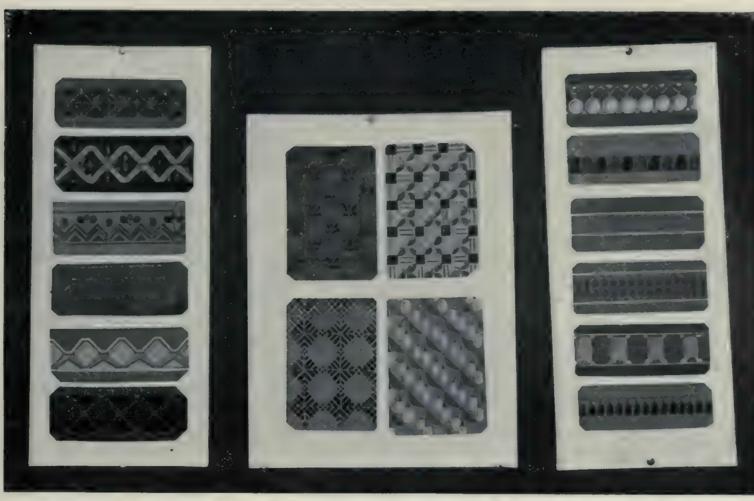


FIG. 138. DESIGNS.

the drawing was taught was somewhat better to work in than a regular schoolroom in the United States, because it had been selected with reference to lighting and had been equipped with desks a little different from the usual, tho they were not expensive ones.

A brief visit to a first-grade classroom revealed the fact that the construction work of the primary grades is, for the most part, connected with directed work in observation on the street, at home or elsewhere. I was shown a large number of those marvelous things made at home which any teacher may call forth from young children if he goes about it in the right way. There were brooms, carts, wagons, automobiles, etc., in great variety, and there was almost as much variety in the material procured and used by the children. All the construction work up to the eighth grade seemed to be of this general type. It is not given a place in the school program corresponding in any degree to the other subjects. The fundamental method in the work was expressed by the principal as (1) observation, (2) understanding, (of forms, principles, processes,

etc.) (3) drawing, (4) making. Pupils of the upper grades in this school, especially in the seventh, have made in the schoolroom (a) a railway station, chiefly out of sheet tin; (b) a model of a theater under construction, mostly of wood; (c) a model of a farm with appropriate buildings. This constructive work corresponds to our sand-table work in America, tho it is carried forward in a somewhat different way and is preceded by directed observation work. To help in this observation work a museum of industrial materials, tools and processes had been provided. This was kept in a large room on the upper floor of the building. Here, for example, a teacher would find brick and stone and mason's tools which may be taken to his classroom for use in an observation lesson. He may also find a great variety of farm implements and some farm machinery. The parts of a modern skate, for exmple, are clearly displayed on a board, also implements of warfare, all the pieces of a school desk, a chair, etc. This museum and the construction work that grew out of its use seemed to be a special hobby of Principal Eber, and, I understood, were not to be found in the other schools of the city.

But of all the suggestive things I found at this remarkable school, the program of studies for the eighth grade interested me most because it seemed to point toward the solution of one of our American problems. The program for the girls was as follows:

Religion	2 hours a week
Reading	3
German Language	3
Domestic Economy	8
(4 hours Theory)	
(4 hours Practice)	
Drawing	2
Singing	1
Gymnastics	2
Needlework	4
Total	25

The principal of the school did not believe in co-education. He said that girls could not and should not do as much work as boys. In his school boys and girls were taught in different rooms, tho in the same building.

The guiding principle in the selection of studies for both boys and girls was to follow the natural development of the children, but at the same time to recognize probable future occupation. The program for the boys was:

Religion	2 hours a week
German Language	2
Reading and Literature	3
History	2
Practical Mathematics, including Bookkeeping	4
Natural Science, Theory	2
Natural Science, Laboratory, Physics,	2
Chemistry	2
Handwork, Wood and Metal, each a half year	4
Drawing	5
Gymnastics	2
Total	32

One hour of the time given to drawing was spent in making working drawings in connection with the shopwork. The remainder was divided between freehand and instrumental drawing.

These programs seemed significant to me, in the first place, because the boys were given thirty-two hours of work a week and the girls twenty-five; in the second place, because the boys were given six hours of work in mathematics and the girls none, except what might come in connection with their work in domestic economy; in the third place because the boys take physics and the girls do not; in the fourth place because in the eighth or finishing year of the elementary school course emphasis was placed upon practical mathematics, laboratory work in science, drawing and shopwork for the boys—in all twenty-one hours out of the thirty-two—and upon domestic economy, needlework, and drawing for the girls—in all fourteen hours out of the twenty-five. These facts are worthy of thoughtful consideration by educators in America.

Formerly six hours a week were given to shopwork thruout the eighth grade, but in the school year 1907-8 physics and chemistry were introduced and the shopwork time reduced to four hours. I saw a class of boys at work in the simply but well equipped physics laboratory and I looked over several of their notebooks. Without hesitation I can say that I have never seen better laboratory notebooks in any high school class, and I had reason to believe that the boys were using their time most profitably in this study.

Three out of the eight half-days I was in Munich were spent in the Flurstrasse school, but I found time to visit several continuation schools, the famous school of industrial art, *Kunstgewerbeschule,* and the Bavar-

ian National Museum containing the great collection of examples of fine craftsmanship arranged in chronological order. At the school of industrial art I was especially fortunate in having a card of introduction from Dr. Kerchensteiner to one of the professors who spoke English

FIG. 139. LIEBBERSTRASSE SCHOOL, MUNICH.

readily. As we went thru the several departments of the school I was constantly running across suggestive processes and new methods of work. For example, in the department of book illustration I saw some charming examples of color work printed from blocks of linoleum. The linoleum had been cut with knife and chisel and then the printing done in a small press. I discovered that much of the lettering in this department was done with a cork point. Sheet metal the thickness of paper was being worked with a round wooden point in much the same way as we tool leather with a rounded steel point. This was done over a blotter or piece of soft cloth. In the class in decorative painting real fruit and flowers were arranged for models. In the woman's department the drawing under Professor Neimeyer especially impressed me. Here mounted

birds of finest plumage were used as models. They were studied (a) in outline, (b) in color, and (c) as decorative motifs. Beautiful shells were studied (a) for the shapes and spots and the laws of their arrangement, and (b) for their delicate colorings. In this same department some remarkable decorative color effects were produced by paper painting—paintings produced by pasting bits of paper on a background.

THE CONTINUATION SCHOOLS

Before going to Munich I had read of its system of continuation schools, but I did not really appreciate the great work they are doing until I went into some of the classes, saw the students at work, noticed the character of the instructors, and, as it were, caught the spirit of these schools. The German continuation school was not in its beginning and is not fundamentally today a trade or technical school, but it is a school of general culture for such boys and girls as are apprenticed to trades. It is intended to supply, as far as that is possible, what such children are obliged to lose by leaving the day schools before a broad general education has been acquired. The law in Bavaria making attendance upon such schools compulsory dates back to 1803. But the law was not really effective until after the passage of the "Regulation of Industry" in 1869 which compelled employers to allow all their workmen who were under eighteen years of age to attend a recognized continuation school, and at the same time gave communes power to frame by-laws making attendance at such schools compulsory. This act was still further strengthened by the Imperial Industrial Law of 1891. The compulsory features of these laws were needed because of the lack of ambition on the part of many apprentices. The laws were comparatively easy to administer because of the German military system. Dr. Sadler, in his excellent work entitled "Continuation Schools in England and Elsewhere," tells us, in 1908, that forty-five forty-sixths of all the people of Germany were living under compulsory continuation school laws. This means attendance thru the elementary school and from eight to twelve hours a week thruout apprenticeship, or up to eighteen years of age for boys and sixteen for girls.

In order that this instruction be of greatest practical value, the industry of the apprentice is made the focal center of his school work. That is to say, the mathematics, the language, the science, the drawing, etc., are taught with special reference to the needs of the industry. This

necessitated the grouping of pupils with reference to the industry rather than locality. Hence, there was established a centrally located continuation school for apprentices to bakers, another for apprentices to shoemakers, and respectively for apprentices to butchers, barbers, chimney-sweeps, glaziers, confectioners, blacksmiths, tailors, machinists, photographers, decorators, coachmen, carpenters, bookbinders, potters, paper-hangers, jewelers, and all the rest up to the number of about fifty. These were housed in four large central school buildings. To these buildings the pupils come for instruction twelve hours a week. The following course of instruction for carpenters is fairly typical: Religion, 1 hour, arithmetic and bookkeeping, 1 hour; studies in life and citizenship, 1 hour; drawing, 6 hours; practical technology—wood, tools, machines, methods of doing work, etc., 2 hours.

It was especially the introduction of this practical technology or instruction in the practical work of the trades and the consequent fitting up of at least one shop or workroom for each trade, that gave the work in Munich distinctive character. These shops were equipped with the very best of appliances, and placed in charge of the very highest type of men in the several trades. Dr. Kerchensteiner had two reasons for establishing these shops or trades centers: First, to elevate the trades, and second, to enable the boy who happened to be working under an inferior or less skilful master, to acquire skill and knowledge above and beyond what he would get from the master to whom he was bound.

The high character of the work done in one of these shops was made clear to me as I visited a class in cooperage. My respect for a barrel grew very rapidly as I saw those apprentices laying out the forms of the staves of elliptical-headed casks, cutting them with great accuracy and in some cases carving the heads with artistic figure groups. The stove-setters' shop or laboratory, the only one in Bavaria, showed apparatus for testing materials as well as methods of building German tile stoves. The pottery room was equipped with a large kiln, three wheels and much other apparatus of a modern pottery. The museum of wood was quite extensive and most practical in character. It contained not only the usual classified samples of wood, bark, fruit, etc., but the pests and the results of diseases of wood were shown, also a large number of useful articles manufactured from wood. The curator of this museum had spent eight years in collecting and classifying this material.

After visiting two of the large buildings the *Liebherrschule,* Fig. 139, devoted to the machine trades, and the *Luisenschule* devoted to the

building trades I at least began to understand the truth of Dr. Kerchensteiner's statement, "Our school system of Munich directly prepares ninety-five per cent of the population, during the period between the sixth and the eighteenth years of age for the trades, commerce, and industry, and attempts to develop its pupils as far as possible in these pursuits."

(*To be continued.*)

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EDITORIAL

WE are grateful to our readers for their responsiveness. After every issue we receive words of commendation and encouragement. Some one is quite sure to have found the last number the "best yet." These messages are always helpful, but they are especially so when coupled with suggestions, or statements of needs. Such statements, also, have not been lacking during the past year, and as we look back over them, we find that they may be arranged into three groups. The first of these calls for more issues of the Magazine. Many readers have said. "It doesn't come often enough," "When are you going to give it to us monthly?", and the like. The second group has called for more attention to the problems of vocational training—more discussions of the questions involved, more detailed accounts of what has been accomplished in this new field. The third group has called for more practical details of courses and methods in manual training, which may be of daily use to the teacher.

A New Magazine

After considering all these needs and consulting many men who are able to take a large view of the present educational situation, we have decided to try to meet all of them by enriching the MANUAL TRAINING MAGAZINE on the side of practical details, and, by publishing another bi-monthly magazine, alternating by months with the MANUAL TRAINING MAGAZINE. This new magazine will begin in September, 1911. It will be called *Vocational Education,* and will be under the same editorial and business management as the MANUAL TRAINING MAGAZINE. The staff of editorial writers has been revised, but will be the same for both publications. For the new magazine an additional advisory staff has been secured representing the most important interests involved in the problems of vocational education. Our announcement in the advertising pages of this issue shows that the new publication is to have the guiding influence of state and city supervisory officers in the fields of both general and vocational education, other educational leaders who stand for sound general education, but are sympathetic toward vocational demands, representative manufacturers and leaders of organized labor who are working for more effective education for industrial workers, university professors of agriculture, art,

domestic art and manual training, leaders in vocational guidance, and directors of trade and technical schools. It is believed that with the interest and active cooperation of such a body of men and women—and both of these are now assured, the editorial staff will be able to send out a magazine that will be an important factor in the solution of many of the present educational problems.

New Associate Editors In selecting the additions to the staff of editorial writers we were desirous of obtaining men of highest personal standing, wide observation in the educational field, and experience in both manual training and vocational work. Fortunately we were able to secure the two men of our first choice, Professor Frank M. Leavitt of the University of Chicago, and Arthur D. Dean of the New York State Education Department.

Up to last year Professor Leavitt's home was in the city of Boston. In 1886 he entered the mechanic arts school of the Massachusetts Institute of Technology. Later he became an instructor in the same school and then principal of the historic Eliot School at Jamaica Plain where he developed courses in woodworking for the grammar grade boys. He became principal of the manual training schools of Boston in 1892, and four years later, under a new organization, assistant director of drawing and manual training. In these positions, thru the exercise of patience, tact and ability, he built up a system of manual training work second to none in the United States. In 1910 he came to the University of Chicago as associate professor of industrial education. In the meantime Mr. Leavitt had taken summer courses at Harvard University, studied sloyd in Sweden, served as secretary and then as president of the Manual Training department of the National Education Association, and president of the Eastern Manual Training Association. While president of the former, his suggestion resulted in the committee that prepared the report on the "Place of Industries in Education," and as president of the latter his diplomacy was a large factor in bringing about the final amalgamation of the Eastern Manual Training Association and the Eastern Art Teachers Association. One of the first attempts to modify the elementary course of study for those children whose interest in industrial work seems stronger than in the traditional work of the school, was made by Mr. Leavitt in the establishment of the experimental class at the Agassiz School, Boston. This was followed by the extension of this sort of industrial training which, after conferences with labor organ-

izations and business men, has resulted in the permanent establishment of the Pre-Apprentice School of Printing and Bookbinding, and other similar ventures in Boston, and finally in the Boys' Trade School which will be opened next September. Mr. Leavitt has formed the habit of working out new problems under conditions that have forced him to be conservative.

Mr. Dean was born in Cambridge, Mass. He was the first boy to enrol as a student in the Ringe Manual Training School. In 1895 he graduated from the Department of Electrical Engineering of the Massachusetts Institute of Technology. After this he taught grammar school manual training for two years in Portland, Maine, introduced manual training into the schools of Malden, Mass., staying there two years, and then went to Springfield, Mass., where he assisted in the organization of the Technical High School, having been elected head of the mechanic arts department. While in Springfield Mr. Dean was invited by the insular government of Porto Rico to investigate the industrial and agricultural conditions of that island with a view to the establishment of industrial schools. The investigation was made and a report presented to the Commissioner of Education. On leaving Springfield in 1906, Mr. Dean became supervisor of education for industrial workers in the schools under the Young Men's Christian Association of Massachusetts and Rhode Island. In this position he took advantage of the opportunity to study the industries and the conditions of industrial workers in many cities. His aim was to be of service by promoting the idea of definite industrial education and establishing schools for textile workers, shoe factory hands, workers in the machine trades, the building trades, etc. About 5000 students living in twenty-eight different cities and towns were in these classes.

For five summers Mr. Dean was at Cornell University, in charge of the department for training teachers of industrial work. It was here that he was brought into touch with conditions in New York State, which later led to his appointment as chief of the division of vocational schools in the State Education Department. Since his appointment to this position he has been much in consultation with manufacturers, school men and the leaders of organized labor with reference to the development of an effective system of vocational schools for New York State. Between-whiles he has written some of the best articles on vocational education that have appeared. He won the first prize in the *Craftsman* competition for an article on the "Relation of Manual Training in the

Public Schools to Industrial Education and Efficiency," and the *Worlds Work* prize for an article on the school of the future, this having just appeared in the April, 1911, number. He has also written for *Machinery*. *American Industries*, and other technical journals, has prepared a bulletin on the "Education of Workers in the Shoe Industry" for the National Society for the Promotion of Industrial Education, has assisted Carroll D. Wright in his "Apprenticeship Bulletin," and written a valuable book, "The Worker and the State," which was published a short time ago by the Century Co. Our readers will recall that in 1898 Mr. Dean wrote the first vocational article that was printed in the MANUAL TRAINING MAGAZINE.

We are glad to welcome both Mr. Leavitt and Mr. Dean to our editorial family and we are confident our readers will look forward to their contributions.

Cleveland Boys' Exposition

An unparalled event in boy annals has become a matter of history in Cleveland. The second annual Cleveland Boys' Exposition was held in Central Armory, the largest public building in that city, May 4th, 5th, and 6th. The capacity of this great building was taxed to the utmost both by exhibits and by attendance. Nearly 12,000 people visited the exhibits and witnessed the contests within the three days.

The movement had the support of the social settlements, Jewish Alliance, city charities, public schools, particularly the manual training department, parochial schools, public libraries, School of Art, School of Music, turnvereins, various branches of the Y. M. C. A., Sunday schools, newspapers, newsboys' organization, and other organizations, religious and educational.

The exhibition was strictly a boy's affair and of course, from its very nature, closely related to manual training. Its object was to inspire the boy to exhibit in friendly contest anything that a boy can do, make, collect, or care for: woodwork of every conceivable kind including wood-turning and wood-carving, metalwork, electrical apparatus, mechanical drawing, printing, art and crafts work of every description, paintings, drawings, signs and posters, designs, photography, collections, pets, contests in music, vocal and instrumental, in literature, including original stories, orations and poems, in commercial work, in boy's scout work, gymnastics, newsboys' stunts, costumes, etc.

A newspaper, the Exposition Special, was printed daily, edited by the boys, containing the best stories, poems and orations and up-to-the-moment news.

There were three entries in all exhibits and contests: (a) boys under thirteen, (b) boys under sixteen, (c) boys under nineteen. First, second, and third awards were given in each exhibit. In all there were 2,240 entries and 1,300 awards. In the giving of awards there was an endeavor to impress an important lesson. They were simple ribbons, rewards of merit without pecuniary value, honors given as recognition of excellence and effort—the highest honor that could be conferred upon any boy.

The exposition was opened by the mayor of the city. It was hoped that Mr. Roosevelt might honor the occasion by his presence, but a telegram of explanation and hearty appreciation was all that he could grant.

Certain lessons must inevitably be impressed upon a boy as a result of this great exposition: the value of enterprise, self respect as the result of feats successfully accomplished, pride in the results of honorable competition upon a basis higher than that of material gain, the value of unity of boy interests, the power of united effort, civic pride, all of which is significant in a city of 600,000 population. —W. E. ROBERTS

ASSOCIATIONS

SCHOOL CRAFTS CLUB.

On Friday evening, February 1, 1911, the School Crafts Club of New York City had an interesting round table discussion at the Graduate Club, 11 East Forty-fourth street. After a very satisfactory dinner at 6:30, the Club separated into three tables, as planned in advance, and the following topics were discussed under their respective leaders: (1) "The Mechanical Problem," led by Fred P. Reagle; (2) "The Furniture Problem," led by Walter I. LeRoy; (3) "High School Problem," led by Wiliam A. Worth.

After these subjects had been thoroly threshed out, and before the final departure for the evening, Albert W. Garritt, President of the Club, called for an expression of opinion from the members as to the success of the meeting and possible subjects for discussion. The abundance of suggestions for future meetings and the enthusiasm of this first one promise well for the success of this popular series of informal gatherings.

ANNUAL DINNER.

On Friday evening, March 10, 1911, was held the annual dinner of the Club at the Phi Gamma Delta House, and was followed by one of the most significant programs that has been offered for a long time. The program card, designed by P. A. Schwarzenbach, excited much favorable comment.

After an eight-course dinner the program presented was as follows:

"The Man and His Job," by Arthur D. Dean, Chief of the Division of Trade Schools, New York State Department of Education; "The Neglect of Manual Work and Art," discussed by Gustave Straubenmüller, Associate Superintendent of Schools, New York City, John Alexander, President of the National Academy of Design, and Leon Dabo, a New York artist; "The Dignity of the Manual Arts," discussed by William McAndrew and Edwin C. Broome.

It would be impossible to give an adequate account of this program within the limits of a reasonable report.

—FRED P. REAGLE, Montclair, New Jersey.

DEPARTMENT OF SUPERINTENDENCE.

The annual meeting of the Department of Superintendence of the National Education Association was held at Mobile, Alabama, February 23-25, 1911. The attendance at this meeting was considerably better than was at first anticipated, altho the general program was considered by many members to be rather inferior to other programs of recent years. There were 1136 names in "Bruce's Bulletin."

At the Thursday morning session the visitors were treated to an exhibit of southern oratory, several speakers participating in the presentation of "A Message of Achievement from the Southland." One brief extract, taken from one of the speeches, must suffice for this report:

"Another cause for gratification is the fact that all our educational problems

and our educational institutions may be unaffected in future by sectional lines; because all sectional lines are wiped out now. They are always wiped out every time the North and the South participate in a public meeting. The latest proof that these sectional lines are almost completely obliterated was offered a few days ago when the metropolis of the South, New Orleans, situated almost in sight of the Panama Canal, was really seriously considered as a competitor with San Francisco, three thousand miles away, as the "logical point" for holding the Panama Exposition."

At the Thursday afternoon session the "Present Status of Education in the Elementary Schools" was discussed by Mrs. Ella Flagg Young of Chicago, President of the National Education Association, who said in part:

"It would be interesting to compare the money expended to-day on education with the amount spent ten years ago, but there is even a more interesting side. Compare especially the physical, mental, and moral training of this time with that period. Vocational or industrial training we now realize is essential—we now understand that many pupils are not, or for economic reasons cannot be, interested in the purely academic studies. Today thruout the country manual training and the household arts are taught as formally as the fundamentals. The influx of peoples of all nations, with varying standards of morality and ethics makes morality in the schools a vital problem. Social hygiene also demands our attention. We have a great deal to learn ourselves. The measure of goodness in a child lies largely in the conformity to the ideals of the teachers, so it behooves us to realize there is more work before us, more hills to climb."

The Tableaux at the close of the Thursday evening session proved very interesting to the visitors. The subject was "Mobile under Five Flags," Spanish, French, English, Confederate and the Stars and Stripes. To the northerners who were present it was extremely interesting to note that it was Mobile under the Confederate flag that aroused the most enthusiasm in the southern audience.

At the business session on Friday morning a sharp debate followed the presentation of the report of the Committee on Economy of Time in Education. Because of the new "Key Alphabet" proposed, concerted attempt was made to postpone action for one year, which was defeated by a vote of 403 to 368. The report which was finally adopted recommends a uniform alphabet for use in indicating the pronunciation of words in dictionaries and text-books.

Two of the paragraphs in the report of the Committee on Resolutions were as follows:

"The question of the extension of the amount and character of federal aid given to education is assuming great importance and demands the earnest consideration of all interested in education. This Department recommends that this question be given a place upon the program of the next annual meeting."

"The Department of Superintendence approves of the use of school buildings as community centers and recognizes in this movement a socializing force of immense significance."

In the Round Table discussion of superintendents of larger cities, Superintendent F. B. Dyer, Cincinnati, discussed the "Economic Aspect of Organization and Course of Study." He urged that exceptionally bright children be given a chance below the high school, that they should have vocational guidance till the

age of fourteen, providing it is essential for them to go out into the world, that their schooling should be continued for two years while they are working.

At the Saturday morning session the general topic was "The Progress and the True Meaning of the Practical in Education." This topic was discussed in three parts as follows: "In Agriculture," by P. G. Holden, Iowa State College, Ames; "In Vocational Training," by President C. B. Gibson, Mechanics' Institute, Rochester, New York; "In the Balanced Course of Study and the All-year-round Schools," by Superintendent William H. Elson, Cleveland, Ohio.

The officers elected for the ensuing year are: President, Charles E. Chadsey, Superintendent of Schools, Denver, Colorado; First Vice-President, O. J. Kern, Superintendent of Schools, Winnebago County, Illinois; Second Vice-President, H. J. Willingham, State Superintendent of Public Instruction, Alabama; Secretary, Harlan Updegraf, Bureau of Education, Washington, D. C. St. Louis was selected for the place of meeting in 1912.

ILLINOIS MANUAL ARTS ASSOCIATION.

That the Illinois Manual Arts Association is a successful organization and is accomplishing a great deal in the way of satisfactory results, is plainly seen from the success of the eighth annual meeting which was held in Normal and Bloomington, Friday and Saturday, March 3 and 4, 1911. The program was of exceptional interest and value.

Friday forenoon was given to the inspection of exhibits and visiting various points of interest. The afternoon session on Friday, which was held in the Manual Arts Building, Illinois State Normal University, was well attended and consisted principally of reports of committees appointed at the 1910 meeting of the association and the discussion of those reports.

In the absence of F. D. Crawshaw of the University of Wisconsin, chairman of the Committee on Course of Study, Charles A. Bennett, Bradley Polytechnic Institute, presented the report for that committee. The report included carefully planned courses of study in the manual arts for the grades and high school, outlined in a suggestive way, allowing community demands to determine largely the nature of the work. The report was adopted as a tentative course, the work of the committee to be continued.

Clinton S. Van Deusen, chairman of the committee on Manual Arts for Rural Schools, in his report suggested a cooperative plan for the teaching of manual training in the rural schools. This plan was described quite fully in the April number of the MANUAL TRAINING MAGAZINE. According to this plan, twenty-five rural schools cooperate in employing a director of manual training who has charge of the work in all of these schools. The director visits each school once each week giving instruction and suggestions, and leaving drawings and typewritten or printed instructions to be followed during the remainder of the week, thus relieving the perhaps already over-worked rural school teacher of the additional burden of directing the work in manual training. The Association adopted Mr. Van Deusen's report, the committee's work to be continued during the coming year.

Professor Frank M. Leavitt, of the University of Chicago, chairman of the committee on State Supervision of Manual Arts, gave the report for that com-

mittee. This report, which was adopted by the Association, favors state supervision of manual arts, placing the supervision in charge of a director who shall be an agent of a state board of education.

The reports on printing and bookbinding in the public schools were given by Leonard W. Wahlstrom, of the Francis Parker School, Chicago, and S. J. Vaughn, of the Northern Illinois Normal School at Dekalb. Mr. Wahlstrom spoke of the great importance of the printing industry in the United States, of its vocational and economic value, and especially of the educational value of printing in the public schools. The work done in the school print shop correlates with and supplements nearly all other subjects of the curriculum, especially in English, art and mathematics. Abundant motive for this work may be supplied in the printing of a school paper and various other printed forms for the school which may be of economic benefit to the school. Mr. Vaughn spoke also regarding the selection and purchase of suitable equipment for beginning such work. Where the appropriation for the purchase of equipment is limited to a small amount, he advised the purchase of only necessary articles, but insisted that they be of good quality. The educational value of bookbinding was also discussed by Mr. Vaughn with reference to its possibilities and its adaptability to suit the needs of all the different grades. As a result of these discussions a number of the members of the association made a visit on Saturday morning to the plant of the Pantagraph Printing and Stationery Company of Bloomington for a more concrete study of these subjects from the practical standpoint.

During the evening session, following the banquet which was served in the Domestic Science Department, Manual Arts Building, the President's address was delivered by William T. Bawden, of the University of Illinois. Mr. Bawden reviewed the history and growth of the Association from its organization seven years ago, stating some of its accomplished results and the problems which are now before it for solution. We quote the following from his address:

"1. This Association must continue its serious study of the place of the manual arts in education. It is true that the pioneer work has been done; the argument for motor education is no longer vigorously denied by leading educators. Nevertheless, the details of the work and the methods by which it should be introduced and administered are still subjects of debate; the manual arts still have an unsettled place in education. In many places we are still on trial—work of a character that is highly esteemed in some communities has been thrown out of others.

"2. We must in some way secure more general agreement among ourselves as to the essentials. This agreement can be exhibited concretely in such ways as by more general adoption and use and criticism of our courses of study.

"3. As a necessary step in the direction of this unanimity, there must be wider dissemination of the facts concerning what the Association is doing, and what it stands for."

Secretary R. E. Heironymus of the Illinois Educational Commission and President David Felmley, a member of the sub-committee on Manual Arts, spoke of the increasing demand for the manual arts and vocational training in our schools, stating what is being done by those committees to meet this demand, in the way of recommending differentiated courses of study designed to meet more fully the

individual needs of the student, in the vocation in which he expects to engage after leaving school.

The Saturday forenoon session, which was held in the Bloomington High School auditorium, was given largely to a continued discussion of the committee reports given Friday afternoon.

Director T. C. Burgess, Bradley Institute, a member of the sub-committee on Manual Arts, spoke on "The Manual Arts in the Public Schools of Illinois." He discussed the growth of the manual arts in our rural, graded, and high schools, as well as our colleges and universities. He spoke also of the work which is being done by the committee mentioned above for the promotion of the manual arts in each of these classes of schools.

The following officers were elected by the Association for the coming year: President, F. M. Leavitt, University of Chicago; Vice-President, A. C. Duncan, Quincy; Secretary-Treasurer, A. C. Newell, State Normal University, Normal. The next meeting of the Association will be held at Bradley Polytechnic Institute, Peoria.

—D. L. FINDLEY, Decatur, Ill.

NATIONAL EDUCATION ASSOCIATION.

Extensive preparations are under way to make the Forty-Ninth Annual Convention at San Francisco, July 8-14, 1911, the largest meeting that has ever been held. Special attention is called to the announcement of the railway lines that join in giving from Montreal and Buffalo a rate of one fare for the round trip to Chicago, to be added to the one fare rate from that point.

Very satisfactory hotel rates have been secured by the Local Committee, especially for entertainment "by the week." Every rate as announced is based on a definite contract filed with the Committee, an assurance that will be especially appreciated by those who attended the Mobile meeting in Fbruary.

The announcement of the program for the Department of Manual Training and Art contains the following topics: Tuesday morning: "To What Extent Does Manual Arts Training Aid in Adjustment to Environment?" C. B. Connelley, Carnegie Technical Schools, Pittsburg; "The Dynamic Value of Manual Arts in Public Education," T. D. Sensor, Department of Public Instruction, Trenton, N. J.; "The Requisites of the Efficient Teacher in Industrial Schools," G. W. Gerwig, Secretary, Board of School Controllers, Allegheny, Pa. Wednesday morning: "The New Standard of Present Day Industrial Education in Europe," Paul Kreutzpointner, Altoona, Pa.; "The Requisites of Effective Teaching in Manual and Household Arts," Helen Louise Johnson, Associate Editor, Good Housekeeping, Springfield, Mass.; "What have Vocational Schools Actually Done for American Development in Commerce, Industry, and the Home?" Frank H. Ball, Supervisor of Manual Training, Cincinnati. Thursday morning: "The Public School Domestic Science Department as an Influence in the Community for Enforcing the Observance of Pure Food Laws, Civic Cleanliness, Etc.," Mattie P. Clark, Polytechnic High School, Oakland, California; "Some Actual Needs for Intelligent Purchasing of Household Commodities and Practical Methods of Keeping Household Accounts," Miss Flagg, Los Angeles; Report of Committee on Nomenclature.

Friday morning: "What Has Art Education in the Public Schools Done for Morality and Citizenship?" A. B. Clark, Leland Stanford University, California; "Art's Service as a Basis for Classified Knowledge," C. C. Henson, Newman Manual Training School, New Orleans; "The Emotional Development as an Asset," May Gearhart, Supervisor of Drawing, Los Angeles.

For copies of the complete program, bulletins of railroad rates and routes, etc. address the Secretary, Irwin Shepard, Winona, Minn.

A new organization, the Industrial Science and Arts Association, has been formed at Muskegon, by a number of men interested in manual training in a few of the cities of Michigan. The purpose of the Association is the study and advancement of all branches of industrial science and art, the raising of the standards of the profession, and the promotion of acquaintance and fellowship among its members.

The cities now represented by active members are Kalamazoo, Grand Rapids, and Muskegon, but it is the plan to take in men from other cities until the membership reaches fifty.

Three meetings will be held each year, in November, February, and May. At each meeting the visiting parties will spend Friday observing methods of handling classes and instruction. Immediately after school a meeting will be held for discussion of the day's work. In the evening a program will be given, and Saturday morning will be spent in visiting industrial plants.

A School Art League was organized at a meeting held in the Fine Arts Building, West Fifty-seventh Street, New York City, the President-elect being John W. Alexander, who is also president of the National Academy of Design. The League was orginally a committee of the Public Education Association, but has developed so far that with the consent of the parent body it has branched off as an independent organization.

At the present time the League is conducting two courses of lectures, one for teachers at the Metropolitan Museum of Art, and another for high school students at the different fine arts exhibitions held during the present year.

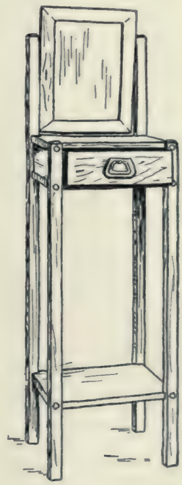
The National Society of Craftsmen arranged a program for a conference to discuss "An Industrial Art School for New York," on Monday, April 24, 1911, with Lockwood de Forest as chairman.

SHOP PROBLEMS

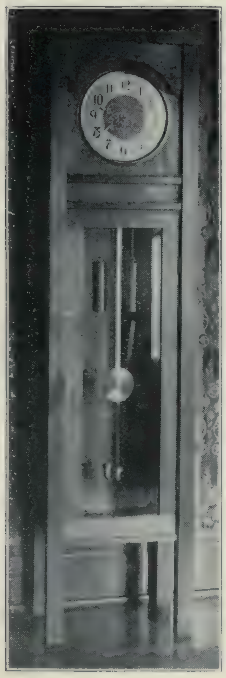
GEO. A. SEATON, Editor.

SHAVING STAND.

No method of construction could be more simple than that shown in the shaving stand. The legs are attached to the three shelves by means of round-head screws, or with ordinary screws with mission nails used at the joints for appearance only. A drawer is made to slide between the two upper shelves and is used to hold the paraphernalia for shaving. The mirror frame is mitered like a picture frame and is held together by corrugated metal fasteners.



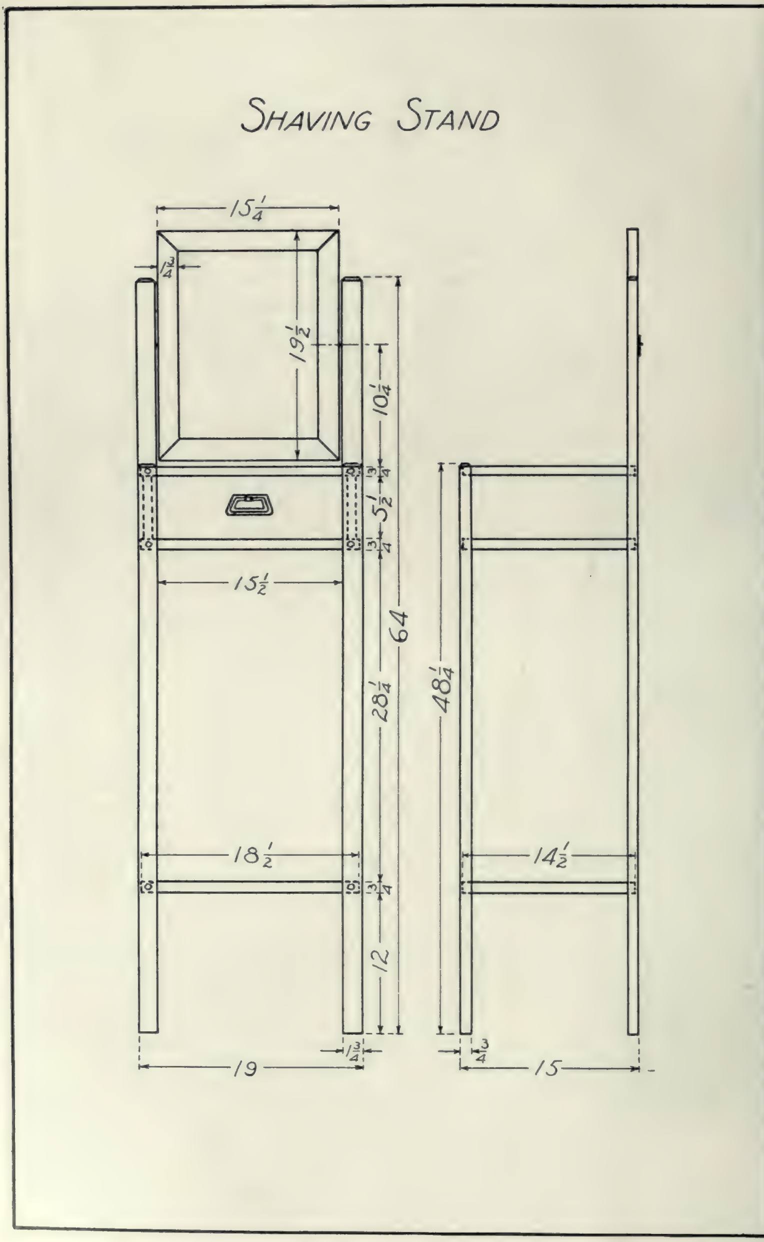
HALL CLOCK.

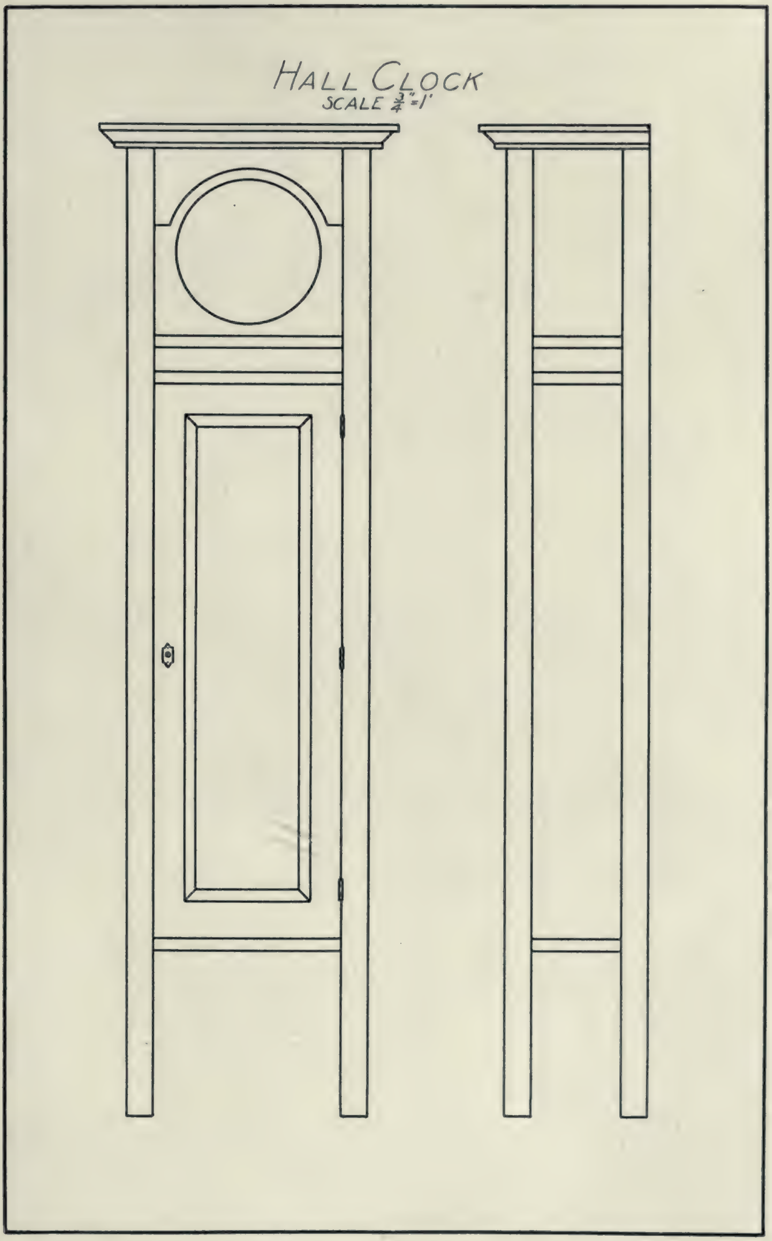


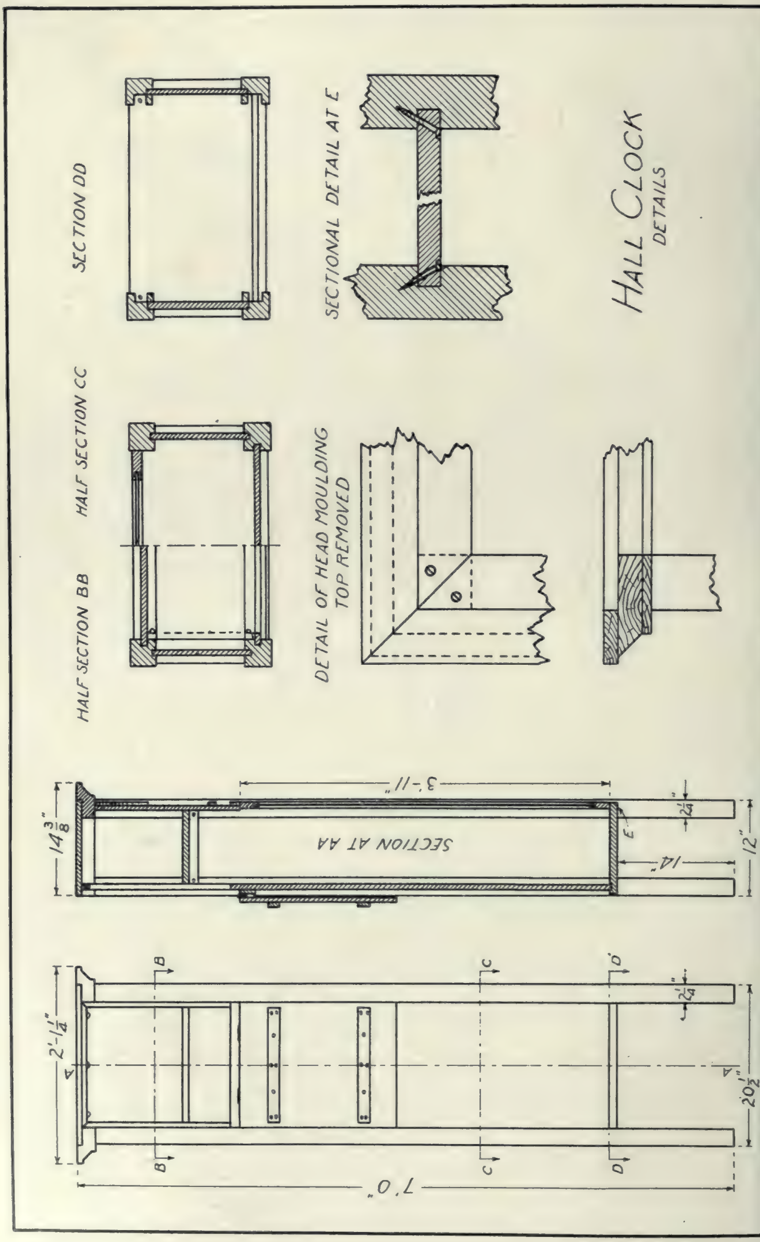
Two sets of drawings show plainly the connection of the hall clock illustrated in the photograph. The drawings are made to scale, tho only the principal dimensions are given. The works and dial in the clock shown cost $13.00, the beveled plate glass $3.00 and the wood and other material $4.50, making the total cost of the clock $20.50. Tho this appears to be quite an undertaking, Hans W. Schmidt of St. Paul, who furnishes the drawing, says that three of his eighth-grade boys have worked out the clock with perfect success.

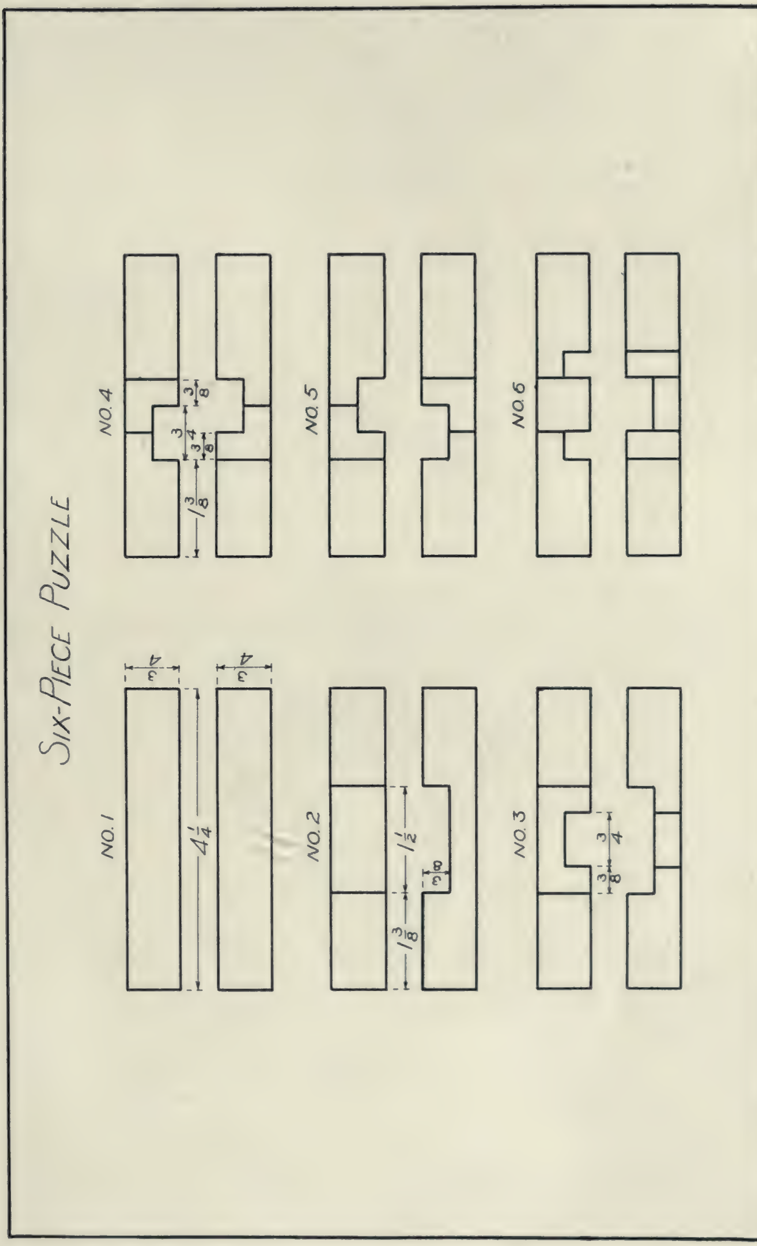
SIX-PIECE PUZZLE.

The drawings for the parts of the six-piece puzzle were made from blueprints in use at Bradley Polytechnic Institute, Peoria, Ill. The six pieces fit together to form a cross, and, as can readily be seen, considerable skill and accuracy in the use of the chisel will be needed in order to make the piece a success. While the drawings are not unusually complicated, the student who can correctly interpret them will have a good fundamental knowledge of working drawings. To insure ease in putting the puzzle together the stock should be planed about one-hundredth inch smaller than the dimensions given on the drawing.


SHAVING STAND
15 1/4
1 3/4
19 1/2
10 1/4
3/4
5 1/2
3/4
15 1/2
64
28 1/4
48 1/4
18 1/2
14 1/2
3/4
12
1 3/4
19
3/4
15

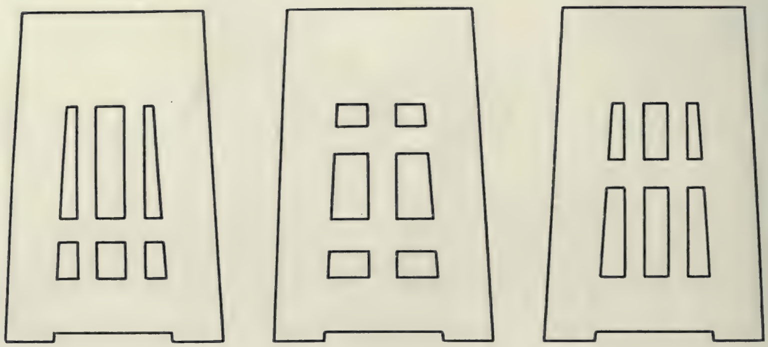

HALL CLOCK
SCALE 3/4" = 1'


HALL CLOCK
DETAILS
SECTION DD
HALF SECTION CC
HALF SECTION BB
SECTIONAL DETAIL AT E
DETAIL OF HEAD MOULDING
TOP REMOVED
SECTION AT AA
7'0"
2'-1¼"
14⅜"
3'-11"
12"
14"
2¼"
20½"


SIX-PIECE PUZZLE
NO. 1
NO. 2
NO. 3
NO. 4
NO. 5
NO. 6

TABOURET.

The design for the tabouret is that of A. L. Polscher, of Cleveland, who has had considerable success with the problem in his eighth grade classes. As a suggestion of some of the possible variations for the decoration upon the sides, Mr. Polscher has given three sketches.

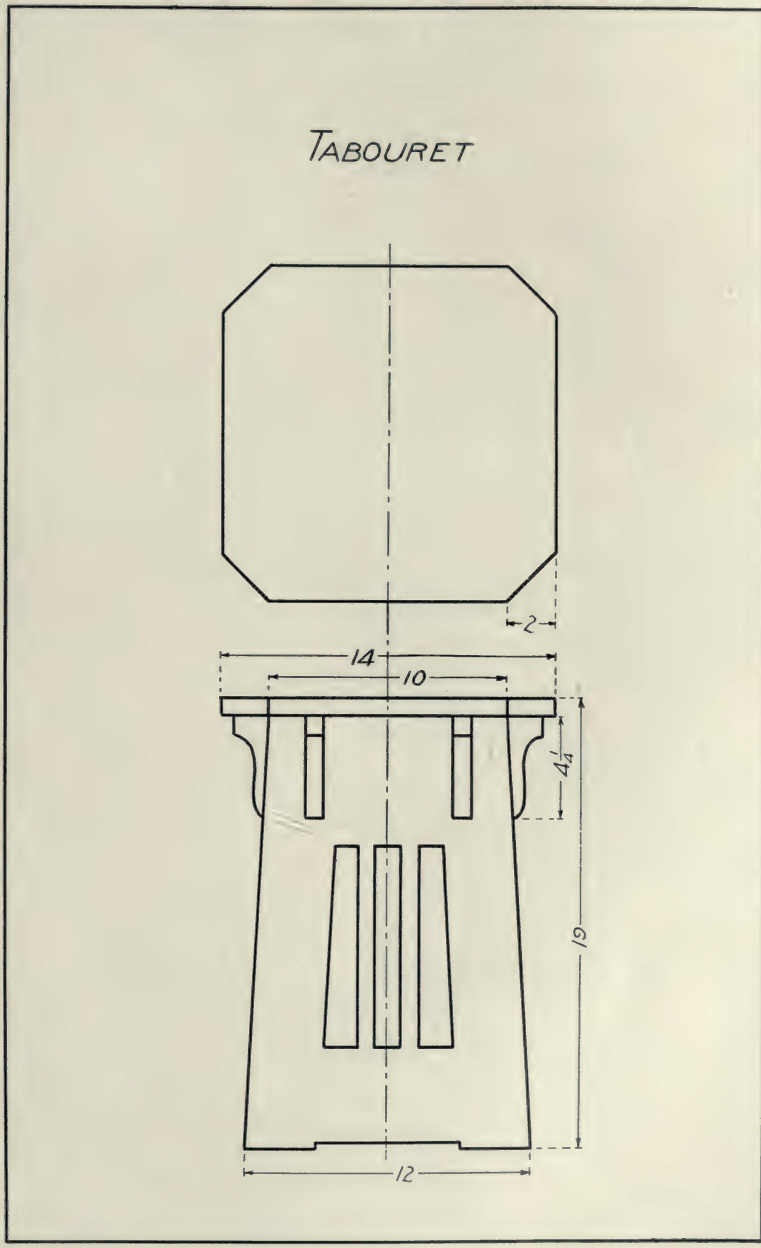


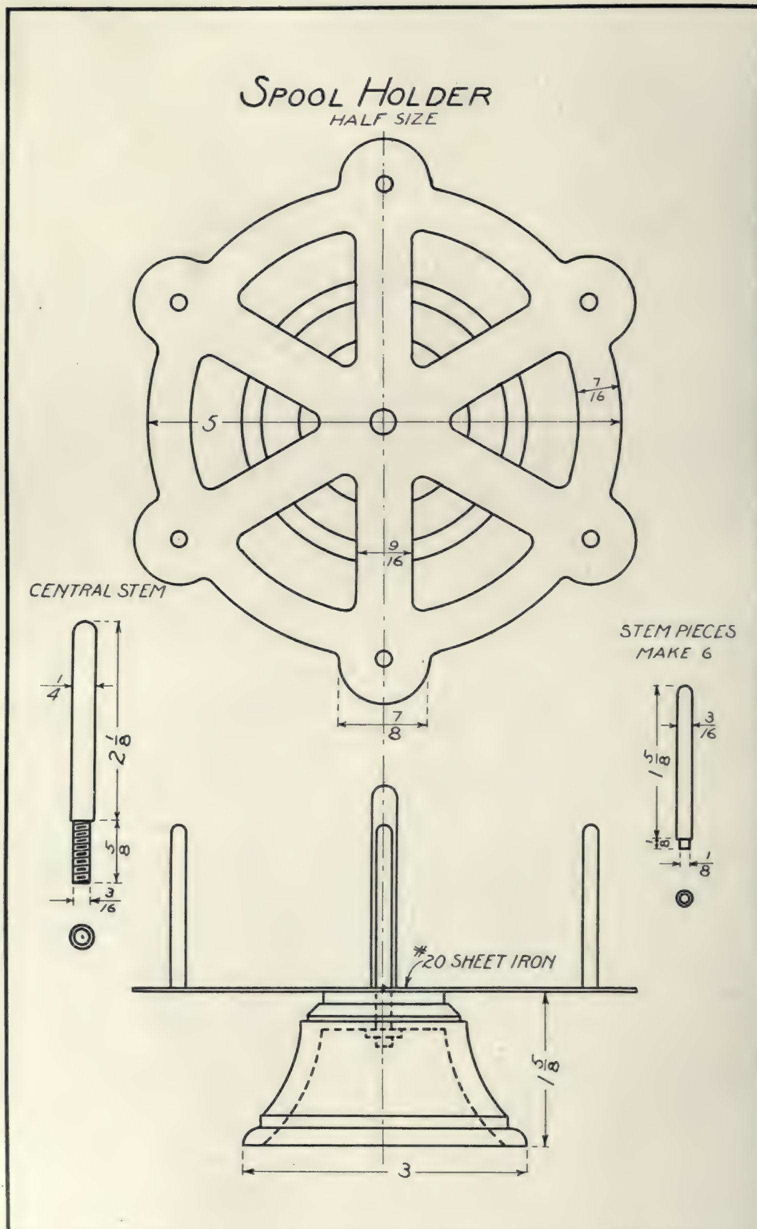
SPOOL HOLDER.

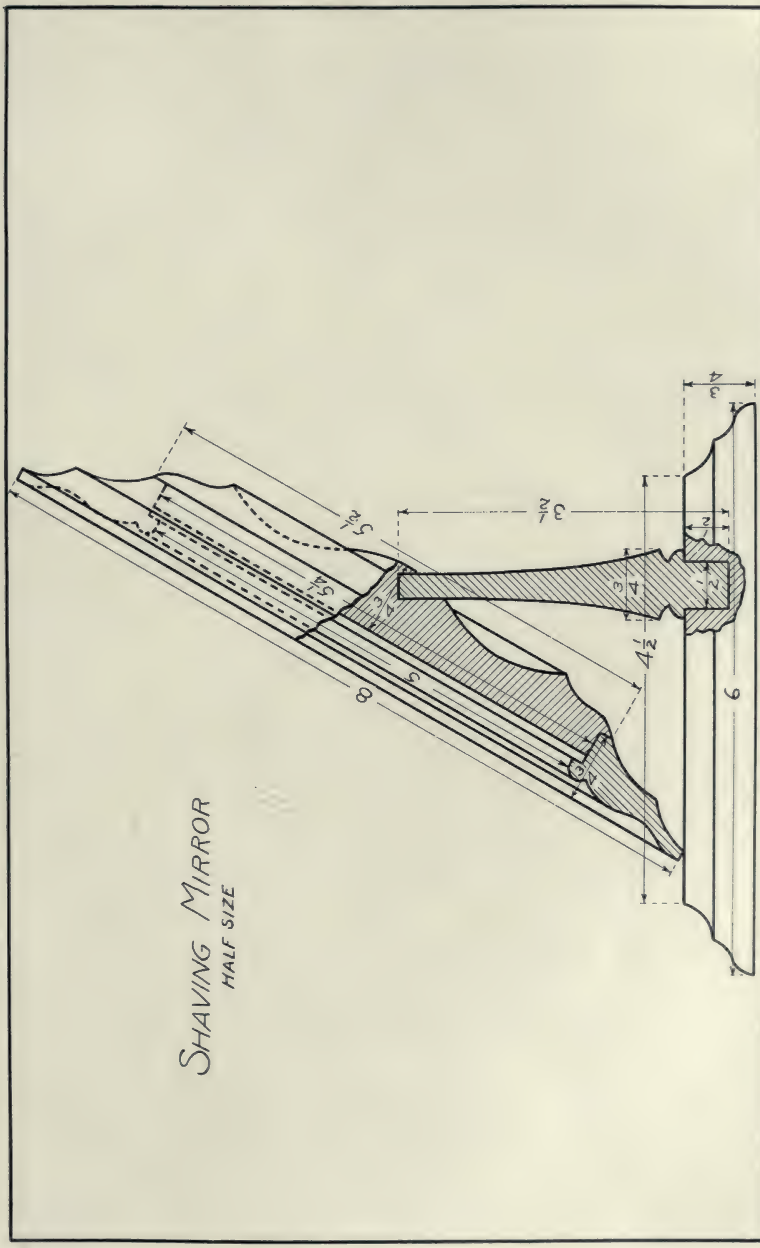
The spool holder is a problem in metalwork which is being used by John F. Robinson in the high school of Wilmington, Delaware. The six stem pieces placed around the outside are riveted to the disk of sheet iron which revolves about the larger central stem. This is held in place by a nut placed inside of the cast base. The stem pieces may be finished by placing them in the drill-chuck upon the lathe and filing them.

SHAVING MIRROR

The shaving mirror presented in this number is from the design and drawing of one of the students of Shaw High School. While there is no adjustment possible, the tilt given to the mirror makes it very satisfactory for use on the average chiffonier. It adds considerably to the attractiveness to use a beveled mirror instead of the cheaper plain one.


TABOURET
2
14
10
4¼
19
12


SPOOL HOLDER
HALF SIZE
5
7/16
9/16
7/8
CENTRAL STEM
1/4
$2\frac{1}{8}$
5/8
3/16
STEM PIECES
MAKE 6
3/16
$1\frac{5}{8}$
1/8
1/8
#20 SHEET IRON
$1\frac{5}{8}$
3


SHAVING MIRROR
HALF SIZE
8
5
$4\frac{1}{2}$
$3\frac{1}{2}$
$5\frac{1}{2}$
6
$\frac{3}{4}$

CURRENT ITEMS

The effect of industrial schools upon the attendance at regular high schools is a subject of considerable interest in some of the Eastern cities. Homer P. Lewis, superintendent of schools in Worcester, Mass. makes the following statement:

"The attendance in our high schools has increased about 500 since the industrial school was opened a year and a half ago. The opening of the industrial school did not affect the attendance upon our high schools so much as I expected. Of the 125 pupils attending the industrial schools, probably not more than 25 would have attended the high schools steadily."

NORTH ATLANTIC STATES.

Some of the labor unions in New England seem to be suspicious of the movement toward trade and vocational education. They seem to fear that such schools will be dominated by the manufacturers instead of by the educators. A striking illustration is in the city of Brockton, where the efforts to establish a school in connection with the shoe industry has not yet been successful, tho the matter has been under discussion for several months. In Newport also, some objection has been made to the evening classes in machine work at the Townsend Industrial School. To offset these, however, many statements have been made during the past few months by labor leaders showing that in general, they thoroly approve of the movement toward vocational training.

Cambridge, Mass. has established a school for young girls who have completed their public school education and wish to prepare themselves to earn a living by handwork. It offers courses in dressmaking and millinery, and aims, thru its supplementary courses in cooking, sewing, physical exercise and hygiene, to develop a healthy and intelligent mind in a healthy and efficient body. The school also aims to develop it its pupils an understanding of their work and sense of responsibility toward it, and a desire to become capable and intelligent workers.

The Congress of Technology which met in Boston on April 10 and 11 in celebration of the semi-centennial of the signing of the charter of the Massachusetts Institute of Technology was a pronounced success on the two main lines laid out by its projectors. The Congress opened on the afternoon of April 10 with an address by President Maclaurin of the Institute on "Some Factors in the Institute's Success." The greatest of these, he said, was the method of teaching due to William Barton Rogers, the founder of the Institute, and now phrased as "the learning by doing."

The second day of the Congress was given over to the presentation of papers on various aspects of applied science. These papers were grouped in six divisions

so arranged that the large numbers of the outside public which attended all the sessions were able to hear papers on the topics in which they were especially interested.

The Congress came to its climax with the banquet in Symphony Hall on the evening of April 11th when the enthusiasm of the thousand of Institute Alumni and their guests who filled the floor of the hall was a sort of summary of the impressions made by the two days' proceedings. The papers presented at the public session gave to the audiences an extraordinarily adequate idea of how completely applied science shapes and controls the living conditions of the present. And as all the papers were by alumni or members of the faculty of the Institute it was also made clear how large a part the Institute had played in creating the applied science today.

These two ideas were expressed along with the third idea more immediately practical at the great banquet. It has been clear for some time that the future development of the Institute of Technology is hampered by the lack of adequate endowments and buildings. The feeling that the beginning of the next half century of the Institute ought soon to see a New Technology, carrying on the standards of the past with greater facilities was the dominant note in all the speeches at the banquet. The alumni are eager to do their full share toward making this New Technology a reality. Their earnestness was shown by Pres. Maclaurin's announcement at the banquet, that alumni have already definitely pledged themselves to give a very large part of the price necessary for buying a new site for the Institute, and that Edward N. Kagar, Tech. '93, President of the Universal Portland Cement Co. has promised as a gift all the cement needed for erecting the new buildings in reinforced concrete. Meanwhile, the question of the site itself, Dr. Maclaurin said, had been narrowed to a choice between three sites all of which are within a short distance of the present buildings. It is expected that this question of a new site, upon which everything else in the development of the Institute depends, will very soon be settled.

NORTH CENTRAL STATES.

A recent bulletin issued from the Ohio state education department gives the following statistics; sixty-four high schools now have manual training. This is a gain of 40% over last year. Forty-eight schools have domestic science which is a gain of 85% over the year before. There are 30,000 boys in the state enrolled in manual training classes and 16,000 girls in domestic science classes. The report states that the agitation for reform and the readjustment of the schools to the industrial life of the community is no longer looked upon as a fad. The organized educational forces of the state are moving in the direction of industrial and commercial education.

The city of Cincinnati has just opened its first continuation school for girls. Among the subjects taught will be a class in salesmanship in which "store arithmetic" will be taken up. The students will also study fabrics such as wool, silk, flax and cotton, color and design, care of stock, store system, and the method of

MADE BY SIXTH, SEVENTH AND EIGHTH GRADE BOYS AT STATE NORMAL SCHOOL, WAYNE, NEBRASKA.

approaching a prospective customer. Later on domestic science, civics, hygiene and English will be taught.

The Illinois Educational Commission, after a year's work, has prepared a report covering the question of what is possible and desirable in the teaching of manual training, domestic science and agriculture in the public schools of the state. This report was prepared with great care by a sub-committee made up of the people who ought to know the most about these subjects. The Commission feels that this report expresses a safe and careful view of this large field of work. The report as it has come from the press also contains other recommendations of the Educational Commission. The report can be had upon application to the State Superintendent of Public Instruction, Springfield, Ill.

The establishment of Corn Day in the country schools of Illinois has produced the most gratifying results. Boys have planted their corn and cultivated it. They have brought it to the school buildings on that day and exhibited it. They have prepared written exercises describing more or less in detail how they selected the seed corn, how they prepared the soil, how they cultivated it. They have given a more or less careful history of the rainfall and the insect pests. It all seems so simple and easy now that it has been undertaken that there is no reason why it should not be more generally observed throughout the State. The Superintendent of Public Instruction has set aside Friday of the first week of November of each year as Corn Day.

A bill is before the Wisconsin state legislature to make Stout Institute at Menomonie a part of the educational system of the state. This has come about because of the death of Senator Stout, and the willingness of the heirs to present the school to the state. The school represents an investment of nearly $500,000. and best of all, has a national reputation. Such a gift any state might well be glad to accept. It is hoped that this proposition may be accepted owing to the fact that the endowment for the school is not sufficient to maintain it on its present basis. Legislators thruout the state seem to realize the exceptional opportunity in this offer and it is likely that it will be accepted.

A special vocational committee in Kansas City has recommended that four vocational schools be established. First, that a day vocational school for boys and girls be established in which the time will be equally divided between industrial work and the regular public school curriculum. In this school the boys would be taught shopwork in wood and metal, mechanical and freehand drawing, and design. The girls would be taught cooking, garment making, hand sewing, and designing. Second, that a central trade school be opened in which would

be taught printing, carpentry, cabinet-making, moulding, brick-laying, machinist work, steam, gasoline and electrical engineering, sheet metalwork, and plumbing. Third, that a night trade school be established at the manual training high school with the same branches as those named for the central school of trades. Fourth, that a school to teach salesmanship to girls be opened. This school would be carried on in two rooms of the central high school building and would be for girls from fourteen to sixteen years of age. This report was the result of work extending over several months during which investigations were made, including a trip to several of the larger Eastern cities.

Salem, Indiana, reports the introduction of manufacturing problems as a successful feature of manual training work of the present year. Typewriter tables, library tables, home and office fixtures have been a part of the work which the supervisor states has proved beyond a doubt that industrial training can be successfully carried on in a township high school.

A serious fire occurred at the University of Missouri on the 26th of March, destroying the Mechanics Arts Building valued at $80,000. This has caused serious inconvenience to Professor Selvidge and his assistants who are obliged to take refuge in a planing mill not far from the university.

We are indebted to John W. Curtis of Helena for preparing the following statement concerning manual training in the state of Montana:—

Column I shows the number of puplis taking manual training in grades one to five inclusive; column II shows the number of pupils taking manual training in grades six, seven and eight and high school; column III shows the number of girls taking sewing; column IV shows the number of girls taking cooking; column V shows the manual training enrollment for the city systems. The interrogation points indicate that the town has pupils taking manual training, but they are not included in the report.

CITY	I	II	III	IV	V
Billings	——	364	?	?	364
Bozeman	750	195	215	——	1160
Butte	——	783	833	36	1652
Dillon	——	28	47	23	98
Forsyth	90	64	33	——	187
Great Falls	1591	368	350	——	2309
Helena	917	317	146	——	1380
Kalispell	——	39	——	23	62
Lewiston	16	92	87	28	223
Missoula	700	170	185	——	1055
Philipsburg	34	139	40	——	213

Montana's Total........8703

A serious fire occurred at the University of Missouri on the 26th of March, destroying the Mechanics Arts Building valued at $80,000. This has caused serious inconvenience to Professor Selvidge and his assistants who are obliged to take refuge in a planing mill not far from the university.

WESTERN STATES.

Plans for the group of buildings for the state normal school of manual arts at Santa Barbara have been completed by N. S. Ellery, the state engineer. The group is to be constructed in the mission style, and will surround a court, somewhat after the plan of Stanford University. The central building will be one and a half stories high. It will be built of re-enforced concrete and will have a red tile roof. It is expected to cost $100,000, and its equipment $70,000. The sum of $50,000 is asked for an additional administration building to contain the offices and auditorium of the school. A smaller building to cost $10,000 is to be used for a dining room and cafeteria. The total cost of the new buildings is expected to be $250,000.

And still the long list of polytechnic high schools in Southern California keeps growing. Now the word comes that Pasadena is added to the list by the successful termination of a campaign for a $475,000 bond issue. The building is to be constructed on the group plan, similar to that of the Holywood building. It will be placed on a twelve or fifteen acre lot and have an agricultural department.

MADE BY STUDENT AT ILLINOIS STATE NORMAL UNIVERSITY

REVIEWS

The Educational Meaning of the Manual Arts and Industries. By Robert Keable Row. Row, Peterson & Co., Chicago, 1909; 7½x5¼ in., 248 pages; price, $1.25.

This book is a worthy effort to contribute something to a better understanding and appreciation of the value of the manual arts in education. It attempts also to show where, in the schooling of the child, these arts and industries are of greatest value and finally to suggest what general methods should prevail in order to secure the best results in teaching these arts and industries. The book does not attempt to exhaust so large a subject, but rather to give a general survey with emphasis at certain points.

The first chapter is devoted to giving the author's point of view. In this he discusses the educative process, the function of the school, and the aim and motives in education. The second chapter is devoted to a brief historical summary of the educational conception of handwork, reviewing the points of view of educators in European countries and in America. The next twelve chapters are given to the principle theme of the book—the value of the manual arts in education. This is essentially a psychological discussion of impulses and interests, sense training, motor control, etc., with reference to the manual arts, re-inforced in some instances by reports of interesting and significant psychological laboratory experiments with what he calls a "dynamometric saw handle" and a " dynamometric pen." With these he demonstrates, by the methods of scientific experiment, several generally accepted facts, and in the process he brings out some suggestive points in methods of teaching. If these chapters could have been relieved of many of the technical terms of the psychologist, the book would have served a much wider range of readers.

In chapters VIII to XIII, the author discusses intellectual, esthetic, economic and social values in education, also habit and attention in relation to the manual arts. These chapters are helpful, but in the treatment of some subjects they leave one unsatisfied. Perhaps this was intended.

In the later chapters of the book, the language is free from undesirable technicalities, and is clear and forceful. The chapters on general method and his summary are especially strong. They deserve careful study.

It must have taken considerable courage to end a book with a chapter on a suggestive course of study because it is a foregone conclusion that no one will agree with it in detail. However, it is a fitting ending to the book, and if looked upon as intended—merely suggestive—it is sure to be helpful. We consider the high school outlines to be especially so.

Taken as a whole, this book has many excellencies, and is one of the first in a new field that needs to be occupied. —C. A. B.

Exercises in Elementary Algebra. By M. A. Blodgett. The North-Western School Supply Co., Minneapolis, Minn., 1911; 7½x5¼ in. 89 pages; price, 25 cents.

This book differs from others on the same subject in the fact that instead of being a miscellaneous collection of exercises and problems, these are graded and classified, and the principles involved in the different operations are exhibited by means of many concrete illustrations and simple problems. It is not a complete textbook in itself, but can be used as an adjunct to any good high school text. A feature of the book which is worthy of special commendation is the number of new and practical problems.

Elementary Industrial Work. By George H. Jensen, formerly director of manual arts, Louisiana State Normal School, Natchitoches, La. Published by the author, 1910; 8x5¼ in.; 182 pages.

The book begins with directions for work in mechanical drawing, including simple lettering and geometric problems. Then follows a chapter on community work, including doll-house construction, building of houses in paper, holiday work, including envelopes, boxes, valentines, etc. Following these is a chapter on cord and string work, a chapter on "burlap work," chapter on weaving, one on raffia work, one on reed basketry and one on simple bookbinding. At the end of the book is a chapter on design, and another on bird-houses.

Shop Problems in Mathematics. By William E. Breckenridge, Samuel F. Merseneau and Charles F. Moore. Published by Ginn & Co., Boston, 1910. 7½x5 in.; 280 pages; price ———.

According to the preface, this book has two aims; first, to "impart information in regard to shops and shop materials," both woodworking and metalworking, and second, "to give a thoro training in the mathematical operations that are useful in shop practice and science." The first is well carried out in the first two thirds of the book by means of cuts of machines, explanatory diagrams, and practical problems arranged in subjects, some of which are board measure, house building, pulleys, belts and speeds, areas and volumes, pattern-making and foundry work, gear-cutting, etc. The collection of problems is excellent and is well adapted for use in shop classes, or as a source of practical problems for classes in algebra and geometry.

The remainder of the book is devoted to a review of calculation with short methods, mensuration, evaluation of formulae, derivation of formulae from given formulae by solving for any letter, and the solution of right triangles by use of trigonometric formulae. The work is well done and furnishes such mathematical facts and methods as are needed in shop practice, but for science work somewhat more would be requisite.

Some attention is given to the different degrees of accuracy desirable in different kinds of work. It is a serious omission, however, not to refer to the errors in results calculated from actual measurements and the significant figures to be retained. In all measurements there is error which accumulates in calculated results. —Clarence E. Comstock,

Bradley Polytechnic Institute.

RECEIVED.

Metal Work and Etching. By John A. Adams. Popular Mechanics twenty-five cent handbook series. Published by the Popular Mechanics Co., Chicago, Ill. This is an attractive little handbook, bound in cloth, containing many good designs for book ends, desk sets, calendars, match-boxes, watch fobs, pins, cuff buttons, etc.

Industrial Courses. Cincinnati High Schools. Outlines of special courses in English, mathematics (course for girls different from that for boys), industrial geography, shopwork for boys, and industrial work for girls.

Report of the Illinois Educational Commission, 1911. Francis G. Blair—State Superintendent of Public Instruction—Springfield, Ill. This document is sure to attract much attention because it recommends the restoration of the two-mill tax, and because it contains the report of a sub-committee, headed by Dean Davenport of the University of Illinois, outlining courses in agriculture, manual arts, domestic economy, and in doing so makes some significant statements concerning the place and character of vocational courses in the schools of the State.

Program of Study and Industrial Work in the Elementary Semi-Industrial Schools of Indianapolis. Contains suggestions for modifying the work of the seventh and eighth grades to meet the demands of industry.

Your Home and its Decoration. Sent with the compliments of the Sherwin-Williams Company, Cleveland, Ohio. This is a beautifully bound and richly illustrated book of more than 200 pages, containing suggestions for furnishing homes. It treats of doorways, walls, ceilings, fabrics, rugs, colonial houses, the city flat, re-moleding, re-decorating, treatment of woodwork, etc.

Department of Manual Training. Winthrop Normal and Industrial College, Rock Hill, South Carolina. Contains outlines of a variety of courses in elementary handwork. Many of these courses are illustrated with full page halftones.

Final Report of the Committee on the Condition of Art Work in Colleges and Universities. Reprint from the 1910 report of the Western Drawing and Manual Training Association. Ira S. Griffith, Oak Park, Ill., chairman of editorial board. This comprehensive report has been prepared by a committee consisting of John S. Ankeney, University of Missouri, William Woodward, Tulane University, and Edward J. Lake, University of Illinois.

Tenth Annual Report of the Director of Education for the Philippine Islands. Manila, 1910. This report contains many agreeable surprises. Among them is the fact that of 445,826 pupils enrolled in the grades below the high school during the past year, 381,878 were engaged in some form of industrial work. So far as possible, the handwork in every school is being put on a commercial basis. Instruction in the minor industries has in view the training of the pupil to make a serviceable and salable article.

Report of the United States Commissioner of Education, 1910. As usual, this report gives considerable space to industrial education and agricultural education in the United States. It also devotes a chapter to the Prussian systems of vocational schools from 1884 to 1909.

Syllabus of History Work in the First Grade. Bulletin of the State Normal School, Cape Girardeau, Missouri, March 1911. Outline of work done in the training school. Treats the subject under three heads, (1) the shelter problem, (2) food problem, (3) clothing problem. Drawing and construction work are largely involved.

Report of the Michigan State Commission on Industrial and Agricultural Education. Published by the Commission, Lansing, Mich. A report of 95 pages, containing much timely data. The report covers labor conditions, agricultural education, industrial education, conclusions and recommendations.

Report of the Vocational High School Commission, Syracuse, New York. Published by the Board of Education. Contains some very interesting facts concerning the modification of high schools to meet the demands of industry.

Elementary Industrial School Report. Plans, course of study and a brief summary of results. Published by the Board of Education, Cleveland, Ohio.

Annual Report of the Birmingham Public Schools. Birmingham, Ala. Contains full-page illustrations of rooms for manual training and domestic science. Also report of the director of the manual arts.

Some Points in Choosing Textiles. By Charlotte M. Gibbs. University of Illinois bulletin, Champaign, Ill.

Syllabus of Domestic Science and Domestic Art for High Schools of Illinois. Published by the University of Illinois, Champaign, Ill.

Pre-Vocational Classes at the North Bennet Street Industrial School. Boston, Mass. Contains outlines of courses.

How Shall the Little Ones Sew? By Florence Kendrick Johnson. The Peoples' University Extension Society, New York, 1910; price 10 cents. This booklet gives many suggestions for teachers desiring information concerning the teaching of elementary exercises in needle work.

The Gyroscope. By V. E. Johnson. Spon & Chamberlain, New York, 1911; price, 25 cents. This book of 52 pages contains directions for many experiments, some of which are illustrated.

Windmills and Wind Motors. By F. E. Powell. Spon & Chamberlain, New York, 1910; price, 25 cents. This book contains working drawings of several small windmills.

The Use of Illustrative Material in Teaching Agriculture in Rural Schools. By Dick J. Crosby. A reprint from the year book of the depatment of agriculture for the year 1905. Illustrated with three pages of halftones and several line cuts.

Some Problems of the Rural Common School. By A. C. True. Reprint from the year book of the department of agriculture for 1901.

Time Schedule Assignment of Work and Suggestive Problems for 1910-1911. Published by the Board of Education, Cleveland, Ohio. This contains outlines for all the elementary school subjects arranged by grades.

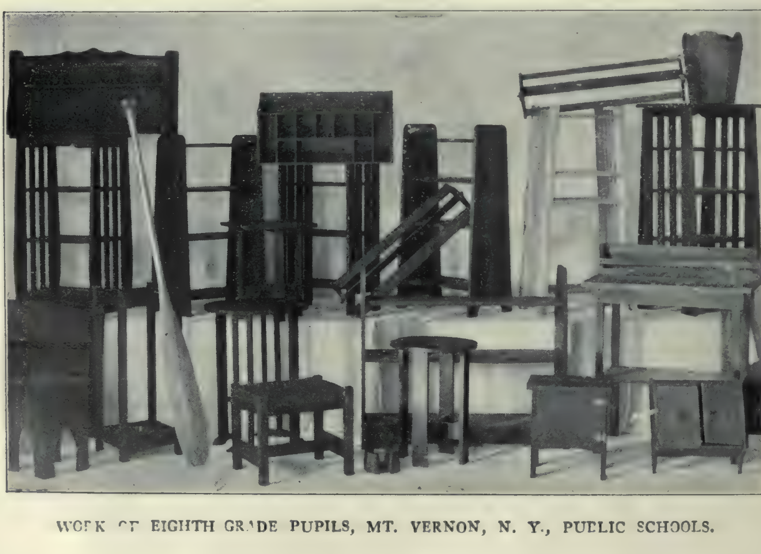
Market Classes and Grades of Meat. By Louis D. Hall, Bulletin No. 147, Agricultural Experimental Station, University of Illinois, Urbana, Illinois. An illustrated pamphlet of fifteen pages.

The Apprenticeship System in Its Relation to Industrial Education. By Carroll D. Wright, Bulletin No. 6-1908, United States Bureau of Education, Washington, D. C. Treats of the extent of the apprenticeship system in the United States, Austria, Belgium, Germany, Switzerland, France, and Hungary. Discusses various types of apprenticeship and gives general considerations and conclusions.

Tuskegee Institute Bulletin, Tuskegee, Alabama. Annual catalog edition, 1909-10. Contains excellent illustrations of the buildings and work of this famous school.

Chicago Public Schools. Course of study for elementary schools for 1910. This contains outlines for art and industrial arts which will be of interest to every supervisor of the manual arts in the elementary schools.

Tuskegee Institute, Tuskegee, Alabama. A recent report of the principal, illustrated with excellent photographs showing the industries and life at Tuskegee.



WORK OF EIGHTH GRADE PUPILS, MT. VERNON, N. Y., PUBLIC SCHOOLS.